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ALGER'S STRANGE ACTION.

SECRETARY OF WAR IGNORES THE GOVERNMENT ENGINEERS AND PERMITS THE POWER CANAL COMPANY AT THE SAULT TO GO AHEAD WITH PREPARATIONS FOR DRAWING A LARGE VOLUME OF WATER FROM THE ST. MARY'S RIVER.

If reports from Washington within the past few days are to be relied upon, Russel A. Alger, secretary of war, who already occupies a very unenviable position before the people of the whole country on account of the war scandals, has had a hand in another strange proceeding of important bearing on commerce of the great lakes. Only a few years ago lake vessel owners were called upon to undertake strong measures of opposition to raft-towing interests represented by the present secretary of war. They were not, therefore, especially pleased upon learning of his appointment to a position in President McKinley's cabinet that would give him the direction of river and harbor improvements, and other important public works, not only on the lakes, but throughout the entire country. They have now encountered in a very unusual proceeding for the war department just what was feared when Secretary Alger's appointment was announced.

It will be remembered that at meetings of the Lake Carriers' Association during two years past, the project of the Michigan-Lake Superior Power Co. for the construction of a power canal at Sault Ste Marie was several times discussed from the standpoint that such a canal might seriously interfere with navigation interests. The vessel owners were told by officers of their organization that they could rest assured that this matter would have the careful attention of the war department engineers, and such was the case, as the canal project was investigated by a special board of engineers consisting of Lieut.-Cols. G. J. Lydecker and C. W. Raymond and Major T. W. Symons. This board long ago presented a report decidedly adverse to the plans of the canal company, but it was buried in the war department until the discovery was made a few days ago that Secretary Alger had, under influences brought to bear by Michigan promoters of the power scheme, ignored the government engineers and told the company to go ahead with its work. It is now reported that night and day forces are engaged on the cut for the canal, but it is not at all probable, in view of the adverse report of the board of government engineers, that the vessel interests will allow the work to proceed without protest, and as the question of water levels involved is one in which Canada is equally interested with the United States, the canal company will very likely meet with some serious complications.

Officers of the Lake Carriers' Association have not as yet had time to inquire into circumstances connected with the war department ruling that has prompted the canal company to go on with its work, and President Frank J. Firth is therefore guarded in a letter which he sends the Review answering inquiry as to what will be done in the matter. Mr. Firth says under date of May 22: "I have written the secretary of war requesting the favor of a copy of the report of the board of engineers and of his order permitting the power canal company to go ahead with its project. I am unable to say until I hear from him whether there is anything calling for present action on the part of the Lake Carriers' Association. My investigations into the general subject a short time ago satisfied me that it was entirely possible to operate the proposed power canal without any possible injury to lake navigation interests, provided suitable remedial works are erected and permanently maintained by the canal company under United States requirement and provision. You recognize, of course, that this question of lake levels must of necessity be an international one, and the government of Canada may assert its interest before final decision is arrived at."

It is quite generally agreed, as Mr. Firth says, that if there was a clear understanding as to what remedial works were necessary and if the same were provided, there would be no special objection to the power canal, but the strange part of the recent proceeding in the war department is the manner in which the canal company is permitted to go ahead without regard to remedial dams or anything else. A Washington dispatch on this score says: "When it was found that the adverse report of the board of army engineers could not be laid aside, the power company's representatives, after several conferences with officials here, devised a method of getting around the action of the engineers. The question was ingeniously raised as to whether, if the power company was satisfied that the waters of the lake would not be lowered, it was really necessary, after all, to obtain a license for the work. Secretary Alger was not willing to decide this point, but sent the representatives of the company over to talk to the attorney-general. That official obligingly decided in quite an informal way—verbally, it is said—that there was no reason why the power company should bother the secretary of war about its project so long as it could assert with clear conscience that the interests of navigation would not be imperiled by the proposed canal. When Secretary Alger was informed of the attorney-general's opinion he promptly addressed a letter to President E. V. Douglas of the power company, in which he stated that in view of the decision of the department of justice no license would be required and that the work might proceed without further delay, with the clear understanding that nothing would be done that might militate against the interests of free navigation."

It is certainly very strange that the heads of engineer corps should permit action of this kind to be taken without vigorous protest on their part. Such a thing would not happen during Gen. Casey's time in the department. One of the members of the board that examined the Sault project said in conversation not long ago: "We did not approve the plans or request of the power company for the general reasons that they did not consider them founded on sufficiently accurate knowledge in regard to the flow of the river, but more particularly because they

considered the matter should be referred to an international board representing the United States and Canadian governments, which board should make rules and regulations governing the use of the water for power purposes and should prescribe such regulating works as might be deemed necessary. The matter is a complicated one involving a great many and very important interests, and the board of engineers deemed that the present vested interests in the navigation of the river and the locks was of infinitely greater moment and value than a speculative enterprise looking to the development of power, and were unwilling to risk any injury to these navigation interests. The company was warned from the beginning that they should get their affairs on a basis satisfactory to the government before they began operations, but they chose to go ahead in a more or less reckless manner, trusting to get their affairs in shape some way or other. As the navigation interests are so great, and as this river is an international river, and as deflections from the natural channel can be made on either side, it would seem from a common-sense view of the matter that all operations in these waters influencing navigation should be looked after by an international board, or at least under international regulations."

The report of the army engineer board against the project set up first that the power company was unable to prove clear title to the water and the right to deflect it. Objections were also made to the plans of the company for remedial works. "But other and more important considerations would prevent this board," says the report, "from recommending under existing conditions, the authorization of any project involving modifications of the rate or volume of the discharge through the present cross section of the free waterway at the head of the St. Mary's falls. It is evident that such modifications of the discharge might produce changes in the level of Lake Superior which would seriously injure the navigation interests, not only of the United States, but also of Canada. The doing of such injuries is greatest in projects proposing diversions of a portion of the flow from the present channel into new ones, diversions which might be made either on the American or on the Canadian side of the falls, with the consent of only one of the two governments interested in the lake navigation. If any project modifying the volume or rate of discharge is authorized by either government, it should be done under conditions satisfactory to the other and the remedial works necessary to prevent injury to the interests of navigation should be designed, supervised and controlled under regulations approved by both governments. In view of the enormous commercial interests at stake, the board earnestly recommends that action be taken, through the proper diplomatic channels, for the formation of an international commission, composed of representatives of the United States and Canadian governments, fully qualified to consider the intricate legal and engineering questions involved, to investigate the conditions governing the discharge of the waters of Lake Superior at St. Mary's falls and their relations to the lake levels; to formulate the conditions under which the waters discharged may be utilized for the development of power without serious danger of injury to the interests of navigation; to definitely establish the boundary line through the rapids of the St. Mary's river; to determine an equitable division of the waterway power privileges of these rapids between the two countries, and to recommend regulations for the guidance of both governments in granting authority for the execution of projects involving changes in the rate of volume of flow and in providing for the construction, maintenance and supervision of remedial works; this commission to report fully its conclusions and recommendations to both governments for consideration and final action. The board is of the opinion that no project contemplating changes in the rate or volume of the flow through the existing cross-section at the head of St. Mary's falls should be authorized by either government until international regulations as above suggested have been established by both governments. It accordingly recommends that the petition of the Michigan-Lake Superior Power Co. be not granted."

The new schedule for ore shovelers at Ashtabula, Fairport, Conneaut and Erie is as follows: For unloading boats, 10½ cents a ton; overtime, 18 cents per hour extra; loading ore by machine, 6 cents a ton; loading by hand, 60,000-pound cars, \$2; 70,000-pound cars, \$2.25; 80,000-pound cars, \$2.50; 90,000-pound cars, \$2.75; 100,000-pound cars, \$3; trimming, 60,000 and 70,000-pound cars, 20 cents; 80,000 and 90,000-pound cars, 25 cents; 100,000-pound cars, 30 cents; day work of ten hours, \$1.50; eleven hours, \$1.57½; twelve hours, \$1.65; for over twelve hours, 30 cents an hour, double time. The hoisters will receive 35 cents an hour for overtime with their regular wages at \$60 a month.

Edward W. Hyde, treasurer of the Bath Iron Works, Bath, Me., assigns improper loading as the cause of the failure of the "tramp" steamer Winifred to come up to contract stipulations, which has been made the basis for a suit against the Bath works for damages, as mentioned in last week's Review. Mr. Hyde says that instead of being put to the use for which she was intended as a tramp steamer, the Winifred was chartered to a company which has used her in the transportation of passengers and light freight.

A unique ceremony marked the driving of the first rivet in the construction of the battleship Ohio, building at the Union Iron Works, San Francisco. Capt. L. J. Allen, U. S. N., inspector of machinery, and Naval Constructor Elliott Snow drove the first rivet, while Equipment Officer Lieut. H. T. Mayo handled the clinching iron. George W. Dickie, superintendent of the Union Iron Works held the snapping tool and James Dickie was heater boy. President Scott superintended the performance.

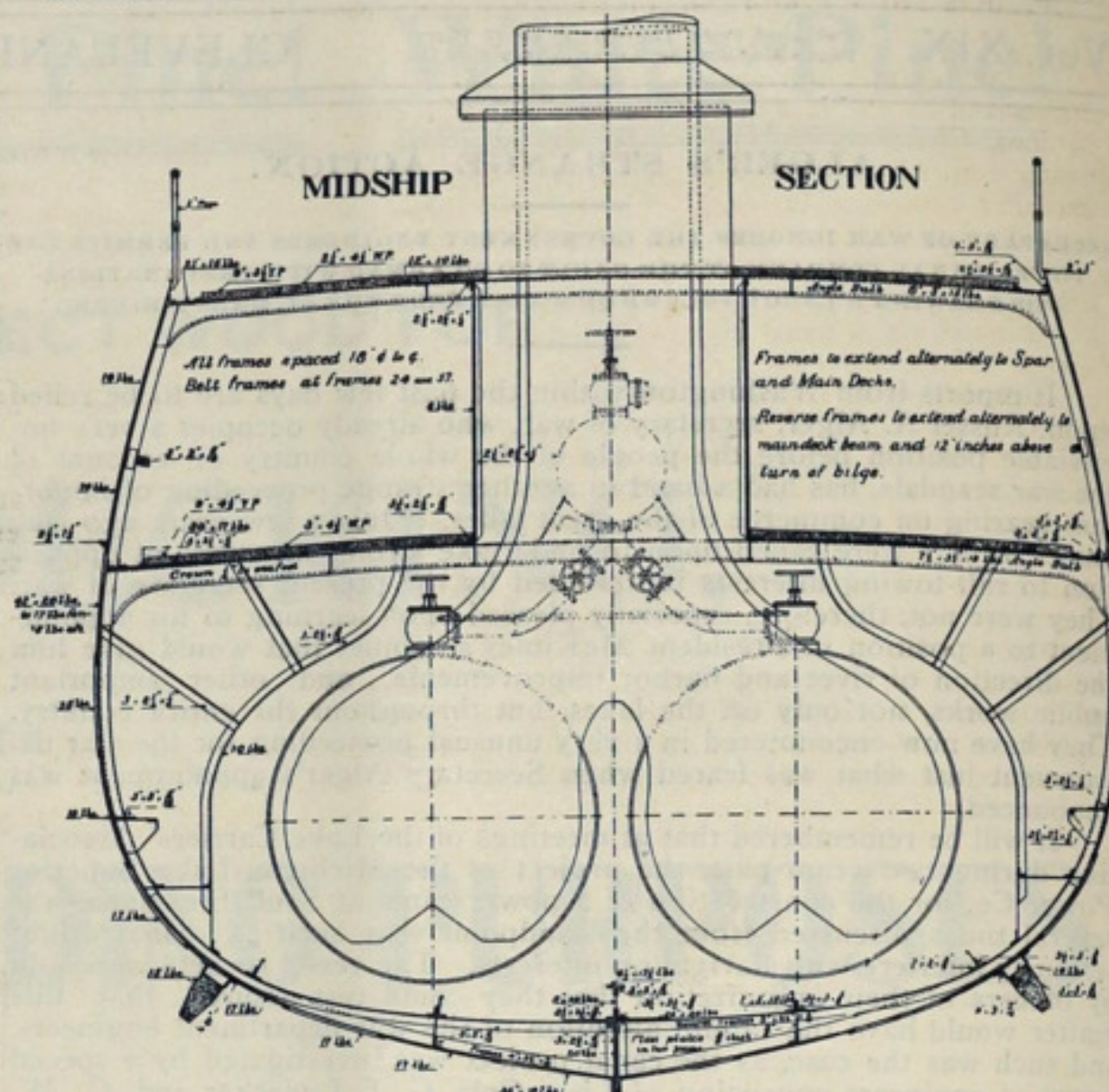
A MODERN LIGHT-SHIP.

CONTRACT TO BE AWARDED BY THE UNITED STATES LIGHT-HOUSE BOARD FOR THE CONSTRUCTION OF A STEEL STEAM VESSEL FOR SERVICE NEAR PORTSMOUTH, VA.—ANOTHER THOROUGHLY MODERN VESSEL WITH THE BEST OF EQUIPMENT IN EVERY RESPECT.

Specifications have been issued by the United States light-house board for the construction of a light-ship of first-class type, bids upon which will be received until June 10, 1899. The vessel, which is designed for service in the vicinity of Portsmouth, Va., will be 112 feet in length between perpendiculars, from the inside of stem to inside of rudder post; 28 feet 6 inches breadth, molded, and 14 feet 10½ inches depth of hold from top of keel to top of main deck beam amidship. The hull will be of steel throughout, and there will be three decks, the main and spar decks being continuous and the lower deck extending from the stem to the coal-bunker bulkhead, and from the sternpost to the engine bulkhead. The ship will be divided by water-tight steel bulkheads into five compartments. Each of the bulkheads will have sluice valves, with the exception of the forward collision bulkhead, in which there will be no openings whatever. Accommodations for officers will be located on the main deck, there being four staterooms, one pantry, one chart room and a water closet. Dynamos and engines for the electric plant will also be located on the main deck within the engine and boiler casing. Accommodations for the crew will be forward on the main deck, and will consist of five staterooms with two beds in each room, together with pantry, galley, lockers, wash room, water closets, etc., and a mess room amidships, between the staterooms. Forward will be built a lamp room, together with shelves and lockers. The vessel will have two hollow steel masts, and the lights will consist of a cluster of three on each top, adapted for both electricity and oil lamps. The fog signal will be operated by steam, and the cut-off worked by a steam engine designed for the purpose. All workmanship must be fully up to the requirements of the American Ship Masters' Association. All deck planks are to be clear and thoroughly seasoned Maine or Michigan white pine. Ceilings in the holds will be yellow pine.

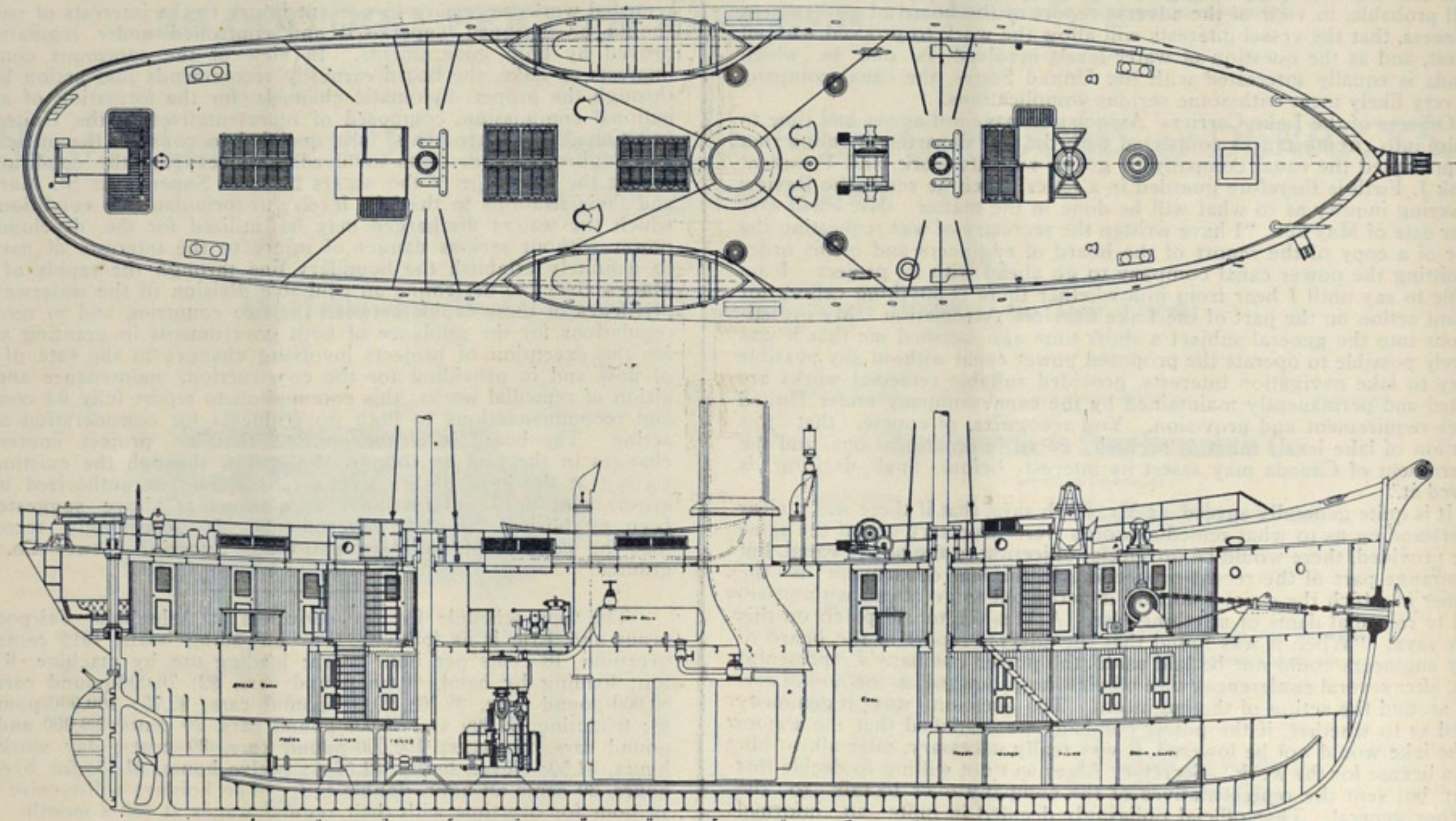
The vessel will be fitted with one inverted surface-condensing single-cylinder engine, with a stroke of 22 inches and a cylinder 23 inches in diameter, driving one right-handed four-bladed cast-iron propeller of the solid type, about 7 feet 3 inches in diameter and with suitable pitch of screw. Steam will be furnished by two cylindrical straight-tubular boilers, designed for a working pressure of 100 pounds per square inch, the diameter being 9 feet and the length 16 feet 7½ inches. The condenser will contain 875 square feet of cooling surface. Valves will be operated by the Stephenson double-bar link motion. The air pump will be of the vertical

of wood. At the mastheads will be built a gallery to surround the electric lanterns and serve as day marks. Specifications for the electric lighting plant provide that engines and generators of the General Electric Co. type of manufacture shall be provided. The vessel is to be wired for eighty 16-



MIDSHIP SECTION—VIEW OF LIGHT-SHIP.

candle-power incandescent lamps and eight 100-candle-power lamps, four on each mast. Each of the lanterns on the masts will have a marine water-tight switch and receptacle, so that it can be turned off or on independently of the rest.



INBOARD AND DECK PLANS OF THE LIGHT-SHIP TO BE BUILT FOR THE UNITED STATES GOVERNMENT.

duplex type of Worthington or Blake manufacture. Boilers will be fitted with Fox corrugated furnaces, the diameter of which inside the corrugations will be 40 inches. The equipment is to be modern in all respects, including a steam windlass and an anchor weighing 2,000 pounds. The vessel will be heated throughout with steam and will be fitted with eighteen tanks, having an aggregate capacity of about 12,000 gallons. Six tanks will be stowed in the after hold and twelve tanks in the forward hold. A feature of the equipment will be the provision of a double-cylinder steam hoister, capable of lifting easily 2,500 pounds. The vessel will be fitted with two whaleboats, each 26 feet in length and 6 feet beam.

As before stated there will be two masts, each to be built of steel having a tensile strength ranging from 55,000 to 60,000 pounds. The distance from the 12 feet water line to the focus of the lights will be 59 feet. The greatest diameter of the masts will be 15 inches outside, the topmast to be

Nearly all the ship building yards at Nantes and Chantenay, France, are in full activity. At the Chantiers de la Loire the stocks seem never to be empty. Several large vessels have been launched in the course of the year, and others, including torpedo boats for the French government, are in course of construction. Under the fostering care of the government this industry has made immense strides, and finds its sequel in the important shipping companies which have sprung up in the last few years, and which are paying their shareholders splendid dividends. It must be borne in mind that the government bounty is in itself a handsome profit.

Among firms well known to Marine Review readers that had interesting and creditable exhibits at the Electrical Exposition at New York were the Stirling Co. of Chicago, John A. Roebling's Sons & Co., and the Jos. Dixon Crucible Co.

NEW PROTECTED CRUISERS.

FINAL DETAILS FOR THEIR CONSTRUCTION ARE ABOUT COMPLETED—TWIN-SCREW ENGINES AND WATER TUBE BOILERS—PARTICULARS OF MACHINERY.

Final details for the construction of the six protected cruisers, authorized by the last congress, and which are to be named Denver, Des Moines, Chattanooga, Galveston, Tacoma and Cleveland, are now practically completed. The hull plans were decided upon some time ago, and extended reference was made to them in these columns, but information regarding machinery has only lately been given out. The design, briefly stated, is for copper sheathed vessels of about 3400 tons displacement in cruising trim, or a little larger than the Raleigh and Cincinnati. They are to be ships of great steaming radius, and therefore of only 16½ knots speed. They are expected to steam 2,800 knots at full speed without replenishing coal supplies, while at 10 knots their radius will be 6,925 miles, or the entire distance from San Francisco to Manila.

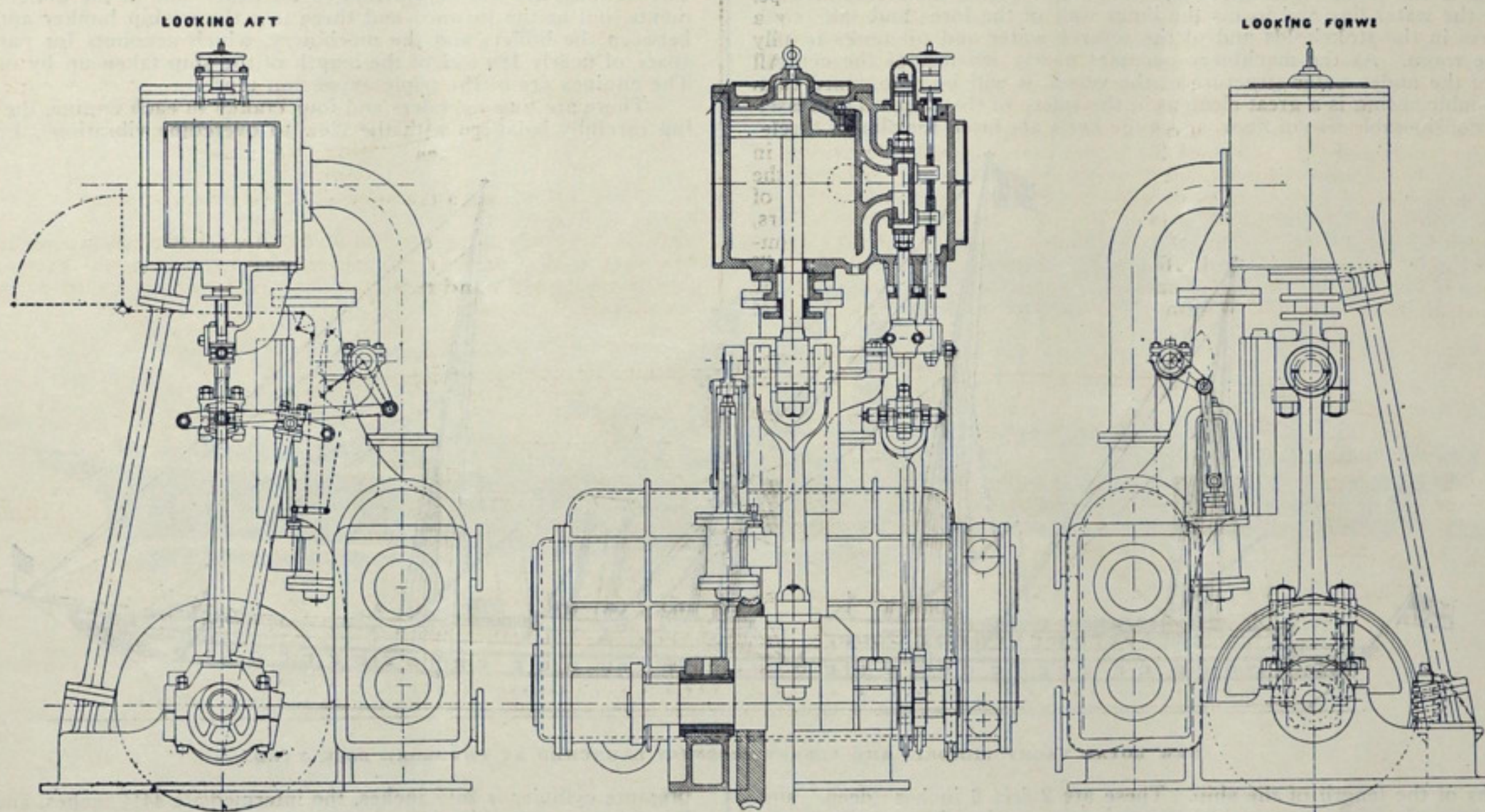
Bids on these ships will be accepted in two classes—according to the department plans and on plans submitted by the builders. The bureau of steam engineering has not yet determined which of the leading types of marine water tube boilers will be used, although other plans as to machinery are complete. Three methods of boiler arrangement are in course of preparation, involving the use of the Thornycroft, the Babcock & Wilcox and Niclausse. Certain of the bureau experts are urging the adoption of the Thornycroft boiler, on the ground that it can be driven to a higher degree of efficiency than the other types, but the weight of opinion in the bureau, as well as among the members of the board of construction, is in favor of the Babcock & Wilcox as giving the best results under the conditions for which these vessels are being specially

engine will be forged in two pieces, the shaft for the forward low pressure and the high pressure cylinders forming one piece, and the intermediate pressure and the after low pressure cylinders forming the other piece. All crank, thrust and propeller shafting will be below. Shafts, piston rods, connecting rods, valve rods, eccentric rods and working parts generally will be forged nickel steel. Propellers will be rights and lefts of manganese bronze or approved equivalent material and will turn from the ship.

The water tube boilers will be constructed for a working pressure of 275 pounds per square inch. The total grate surface of the six boilers, which will be of 4700 to 4800 horse power, will be at least 300 square feet and the total heating surface about 13,200 square feet. The boilers will be in two compartments, with fire rooms athwartships. There will be two smoke pipes for all the boilers. The forced draft system will consist of three blowers discharging into air tight fire rooms. The air for combustion will be heated by the hot gases circulating among or through tubes arranged in the uptakes or in the upper part of boiler casing, and will be conveyed through ducts fitted with dampers to closed ash pits. There will be steam reversing engines, ash hoists, turning engine, auxiliary pumps, engine for workshop machinery, evaporators and distillers, and such other auxiliary or supplementary machinery, tools, instruments or apparatus as may be necessary.

IMPROVEMENTS IN PLANT LINE SERVICE.

New York, May 23.—A constant and heavy increase in tourist travel to the Canadian provinces during the summer months has induced the Plant line to arrange for placing the handsome steamer La Grande Duchesse on the Boston, Halifax and Charlottetown route. The steamers Halifax and Olivette, which have heretofore been in service on this route,



ENGINE OF THE LIGHT-SHIP DESIGNED FOR SERVICE OFF PORTSMOUTH, VA.

designed—namely, for long run and continuous use at moderate speed and under normal service conditions. It is probable that six Babcock & Wilcox boilers of about 800 horse power each will be specified by the department. Of this horse power 4500 will be required to drive the vessel and 200 to run the auxiliary machinery, leaving a small margin for safety.

The propelling engines will be rights and lefts placed in separate water-tight compartments. They will be of the vertical, inverted cylinder, direct acting, triple expansion type, each with a high pressure cylinder 18 inches, an intermediate pressure cylinder 28¾ inches and two low pressure cylinders 35½ inches in diameter, the stroke of all pistons being 30 inches. The collective indicated horse power of propelling and circulating pump engines will be 4500 when the main engines are making about 172 revolutions per minute, with a steam pressure of 275 pounds in the boilers, reduced to 250 pounds at the high pressure cylinders. The sequence of the location of the four cylinders from the forward part of the vessel will be as follows: first low pressure, high pressure, intermediate pressure and second low pressure. The main valves will be of the piston type for the high pressure and the intermediate pressure cylinders, and the low pressure cylinders will have slide valves, all worked by Stephenson link motions with double bar links. Valve gears will be made interchangeable as far as practicable. There will be one piston valve for each high pressure cylinder and two for each intermediate pressure cylinder, and one slide valve for each low pressure cylinder. Each main piston will have one piston rod, with a cross-head working on a slipper guide. There will be a vertical, single-acting air pump worked from the cross-head of the forward low pressure cylinder. The main circulating pumps will be of the centrifugal type, one for each main condenser. The two auxiliary condensers will have about 450 square feet of cooling surface each and will have combined air and circulating pumps.

Framing of the engines will consist of forged steel columns in front and back. Bed plates will be of cast steel. The crank shaft for each

have had, during the past few seasons, a difficult time in handling the traffic, and so heavy was the demand for passage that many persons who desired to make the trip, particularly through to Charlottetown, were unable to secure accommodations. With the substitution of La Grande Duchesse for the Olivette, however, the aggregate capacity of the vessels on this route will be more than doubled. The Duchesse is a large vessel of 18 knots speed and with a dining room capable of seating 125 persons. She will leave Boston every Saturday after June 10 for Halifax, and every Saturday after July 1 for Hawkesbury and Charlottetown. At Hawkesbury immediate connection will be made for a through route to Newfoundland, making a direct service twice a week from Boston to St. Johns, Newfoundland. It may be well to note that passengers on La Grande Duchesse seem immensely pleased with the telephone exchange, which is a feature of that vessel. The telephone system enables a passenger to telephone from his room to the steward, purser or captain, or to talk with a friend in any other stateroom. Nor is the steamer Halifax, which is to be in service with the Duchesse, to be overlooked. She has undergone a thorough overhauling and will come out for the summer business in first class condition. Travel to the provinces this summer will assuredly be heavier than ever before. The entire district of Nova Scotia, Prince Edward island and Cape Breton, as well as Newfoundland, will share in the increase, and the tourists will not be from New England states alone, as it is now possible to leave New York on the morning train and be landed at Halifax, N. S., at 4 o'clock the next day.

The steamer Florida of the Plant line, which is now in the service of the government as a transport, has just arrived at New York with a regiment of soldiers who came through direct from Nuevitas, Cuba.

Another branch office has been opened by the Magnolia Metal Co. of New York, this time in Montreal for the benefit of Canadian trade. The Montreal office is in room 524, Board of Trade building.

THE QUEEN'S YACHT.

ROYAL PLEASURE CRAFT VICTORIA AND ALBERT SHOWS SEVERAL DEPARTURES FROM ORIGINAL DESIGNS.—LAUNCHED AT PEMBROKE DOCK YARD.

Readers of the Review will doubtless remember that this paper was the first publication on either side of the Atlantic to present a picture of the new Royal yacht Victoria and Albert, building for the British sovereign. The picture, which the Review presented some months ago, was reproduced from the preliminary designs, but these were afterward altered to a considerable extent. The chief changes are in interior arrangement, the reduction of the number of funnels from two to three being the only noticeable change in the exterior appearance as now shown by our reproduction herewith of a photograph of the official drawing furnished to the Review's London correspondent, R. Quiller-Lane, by the superintendent of the Pembroke dock yard, where the yacht was launched on May 9.

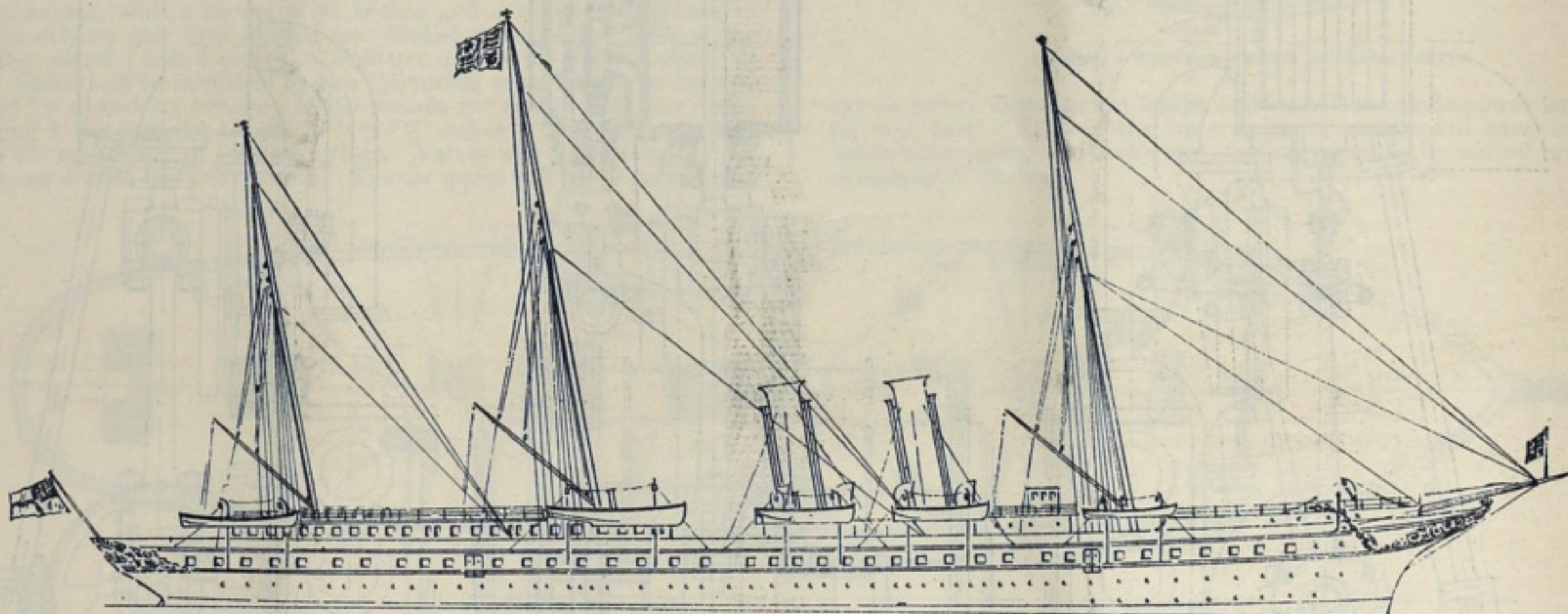
The length of the yacht over all is 439 feet, and between perpendiculars 380 feet, the beam being 50 feet and the moulded depth 37 feet. The draught at normal displacement, 4700 tons, will be 18 feet, which will leave a freeboard of 19 feet, as compared with 11½ feet in the old yacht, so that she should, even in a wild sea, be a very dry ship. The new vessel is thus longer by 101 feet over all, and 80 feet between perpendiculars than the old Victoria and Albert, built in 1854-5. The structure is on the double-bottom system, the internal keelplate amidships being 2 feet 9 inches deep. The frames, of Z-section, are 6 inches deep, and are spaced 4 feet apart. The steel shell plates are from 35 pounds to 20 pounds in thickness, gradually thinning from keelplate upwards, but where the anchors are likely to come into contact with the ship at the bow, the plating is not less than 30 pound. Although the double bottom is only carried to the bilges, a longitudinal water-tight bulkhead is extended to above the water line and forms the inner wall of the fore and aft coal bunkers in the stokeholds and of the reserve water and oil tanks in the engine room. As the machinery occupies nearly 180 feet of the central part of the under-water structure of the vessel, it will be recognized that this double casing is a great element in the safety of the ship. The vessel has a considerable rise of floor, and bilge keels are fitted for almost three-

length of the pavilion, and is directly opposite the entrance at the companion ladders on either side of the ship; and in addition to the broad flight of stairs to the royal apartments below, there is, for the special use of the queen, an electric hoist, 4 feet by 6 feet internal dimensions, to the state deck below. But opening to this deck also are side entrances from the companion ladder or pier, so that when conditions are convenient the queen may enter direct on to the state deck. This state deck has a height of 10 feet; the pavilion of 10 feet 6 inches.

The steering gear is under the water line aft. It is of the now well-known type where the crosshead on the rudder head is connected by rods to nuts mounted on a right and left-hand threaded screw. The revolving of the screw causing the nuts to travel, works the rudder head through the connecting-rods; but in this case, instead of the screw being driven direct by a steam engine, it is operated through shafting extending from the steering engines which are placed in the main engine-rooms. This measure has been adopted to dispense with the ratchet set up too often by the operating of steering engines in their eccentric working by fits and starts. It also obviates the necessity of laying steam pipes through the royal apartments. The ship is, of course, lighted by electricity, three dynamos being provided to work at 80 volts pressure, and in the royal apartments electric heating will also be utilized. Several electric motors will be installed for ventilation, but, as a rule, the system is such that there will be the minimum of artificial ventilation. The boat hoist will be operated by a motor, as will also the after capstan. Special sanitary arrangements have been provided.

The yacht will carry three masts, about 160 feet high, with fore-and-aft rigging, and with two funnels, she will present a smart appearance. While her full speed will be 20 knots, her cruising speed will be 17 knots, and she will carry coal supply sufficient to steam 2,000 miles at 14 knots. The bunkers are not only arranged on either side of the boiler compartments, but at the forward end there is a thwartship bunker and another between the boilers and the machinery, which accounts for part of the space of nearly 180 feet of the length of the ship taken up by machinery. The engines are of the triple-expansion type.

There are four cylinders and four cranks in each engine, the parts being carefully balanced with the view to overcome vibration. Each high-



NEW ROYAL YACHT VICTORIA AND ALBERT RECENTLY LAUNCHED AT PEMBROKE DOCK YARD.

fourths of the length of the ship. These are 2 feet 6 inches deep, and should greatly minimize any tendency to movement in a heavy rolling sea.

The vessel is divided by eight transverse bulkheads carried to the upper deck. They are strongly stiffened at 2-foot centers alternately with channels and angles. There is a longitudinal bulkhead between the two engine-rooms, which, like some of the others, is reinforced by heavy H-section stiffeners. There are other water-tight divisions, and the decks in many cases form water-tight flats, so that the ship is minutely subdivided. The boiler and engine seatings, forming part of the structure above the inner bottom, are of box section, being of steel plates riveted together. The steel shell plates are double riveted and butt-jointed, with inside straps quadruple riveted. The teak planking is 4 inches thick to the turn of the bilge, tapering then to 3 inches above the water line, and then is of 2½ inches in thickness to the bulwarks. This has been coppered over to above the water line. The covering of the whole of the hull with teak, instead of only to above the water line, as in warships, not only improves the appearance, but will in a measure prevent extremes of temperature being felt within the ship. And here also it may be said that all boiler and engine-room casings have been lined outside with 1½-inch teak, screwed and bolted to J-channel bars, the space between the planking and the casing having two layers of silicate cotton, with an air space between. A similar system has been adopted in the ceiling, floors and walls of the royal apartments to deaden noise, as well as to secure as far as possible an equable temperature.

There are five decks carried on bulb beams and laid with pine, which, like all the wood, is non-inflammable. There are the upper, state, lower, orlop and platform decks, with a fore-castle, and a large bridge deck. There is only a chart-house in the center of the latter, with no thwartship bridge, except the roof of the chart-house. A bridge is not necessary, as the fore-castle is without obstruction, the anchors being housed on either side in recessed seats, while the cable gear, etc., is below. The bridge deck, therefore, forms a fine promenade, and is reached by two flights of steps, with brass fittings. Indeed, all the fittings on the principal parts of the ship are of brass. On the after half of the length of this deck is a pavilion 180 feet long, the roof of which also forms a promenade. In it are a state dining-saloon 65 feet long at the after end, a smoking-room, and reception-room. This latter occupies a central position in the

pressure cylinder is 26½ inches, the intermediate 44½ inches, and the two low-pressure cylinders 53 inches in diameter, the stroke being 39 inches. It is expected that the full power—11,000 indicated horse-power—will be realized with 140 revolutions. The boilers are of the Belleville type, with economizers. There are eight elements in each generator, and the boilers are to work at a pressure of 300 pounds, which will be reduced to 250 pounds at the engines. The boilers are equally divided between two boiler-rooms, being placed three abreast in each row, and they will be fired in line with the ship.

NEW COASTING STEAMER.

The Harlan & Hollingsworth Co., Wilmington, Del., announce that they signed, the latter part of last month, a contract to build a three-deck steel vessel to class in the Record of American and Foreign Shipping for American coasting trade for the Metropolitan Steamship Co. The vessel will be 289 feet over all, 271 feet between perpendiculars, 43 feet beam and 31 feet depth to awning deck. Engines will be triple expansion with cylinders 29, 46 and 76 inches diameter and 42 inches stroke, with four Scotch boilers 14 feet diameter and 13 feet long, allowed 175 pounds steam pressure. There will also be a large donkey boiler for auxiliary engines, such as steam capstan, windlass forward, steam capstan aft, seven hoisting engines, necessary pumps, steam steering engines, etc. The vessel will have two steel masts, fore and aft rigged. Accommodations for crew and passengers will be provided in a wooden deck house, electric light plant will also be provided.

This is the eleventh vessel now under construction in the Harlan & Hollingsworth yards. If all the ships under construction or contracted for were placed end to end, they would spread over a length of nearly three-quarters of a mile. Work on all the ships in the yard is progressing rapidly, and it is now definitely decided that the torpedo boat destroyer Stringham will be launched June 10 at 1:30 P. M. A granddaughter of the late Commodore Stringham will act as sponsor, and the launch will probably be memorable for Wilmington, as the president, the secretary of the navy and many other officials will be invited from Washington, as well as a large party from New York and Baltimore.

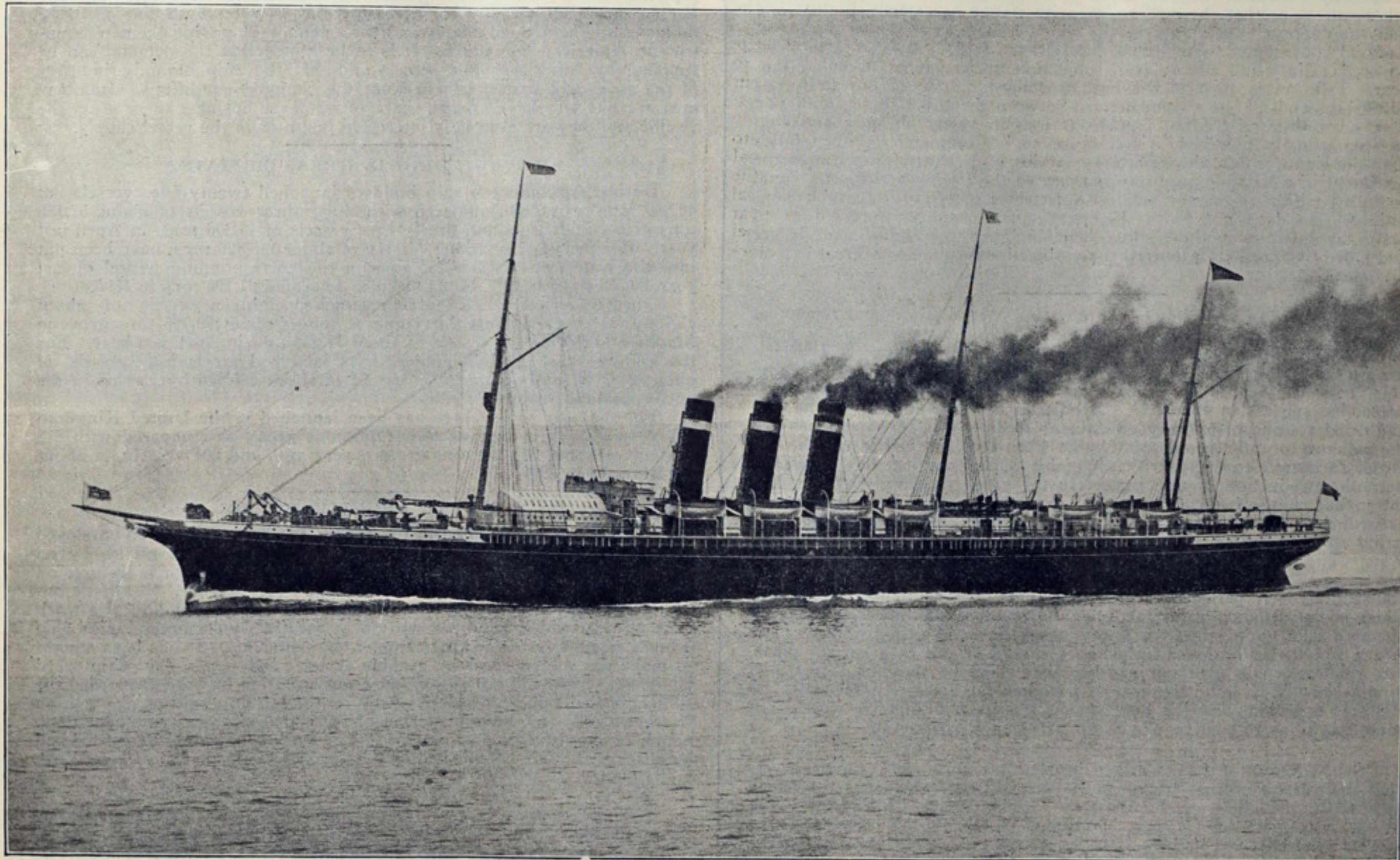
LAKE SHIP YARD MATTERS.

ANOTHER MITCHELL STEAMER—PLANS FOR INCLUDING THE WHEELER YARD IN THE CONSOLIDATION—NOTES FROM CHICAGO.

Another steel steamer for Capt. John Mitchell of Cleveland and his associates, will be built at the Globe yard of the American Ship Building Co. Considerable figuring has been going on for several days past, as it is fully understood, of course, that the builders will have orders for all they can do for a long time to come, just as soon as the strain on the steel works for delivery of material is removed. For the present, however, the situation as to material, both as regards prices and delivery, is such as to cause both owners and builders to go slow with their plans. The Bessemer Steamship Co. is understood to have turned down entirely for the time being negotiations which they took up recently for two or three new ships. This was due, it is said, to prices for material being looked upon as prohibitive from a ship building standpoint. Material for the steamer which will be built for the Mitchell interest was secured by option some time ago. The new ship will be practically a duplicate of the steamer now on the stocks at the Globe yard for Capt. Mitchell and others—somewhat larger than the Hanna and Holden. It is not probable that the order for such a ship would be taken now for delivery next May at less than about \$260,000, as against little more

the local organization on account of the consolidation. As manager of the Chicago works, Mr. W. I. Babcock has been entirely in touch and in control of all its affairs. With his ability fully recognized and with respect for his authority in all departments of the works, a change would have proven especially unfortunate at this time, when arrangements have been made for enlargement of the dry dock and with an important addition to the engine department nearing completion. Cabin work on the passenger steamer Illinois for the Northern Michigan Transportation Co. is being hurried, and she will be delivered to her owners early next month. Work on the freight steamer Maunaloa and consort Manila for the Minnesota Steamship Co. is also progressing as rapidly as possible, but there is still considerable to be done on them before they will have reached their launching stage. Supt. H. Penton of the engine department is engaged in carrying out a plan of providing and maintaining in the enlarged engine works a reading and lecture room for the free use of the workmen. The idea is as yet in the preliminary stage, and more may be said of it later on, but it will undoubtedly be carried out in a manner decidedly advantageous to the men."

It is likely there will be little or no work done this summer on the naval stations and ships in Cuba and Porto Rico. The property acquired



SERIOUS ACCIDENT TO THE AMERICAN LINER PARIS.

Serious doubt is entertained as to whether the American liner Paris can be recovered from the outlying ridge of the Manacles where she struck on the morning of May 21. The vessel, which stranded at a point half a mile from where the wrecked Atlantic transport liner Mohegan lies, is pierced by rocks amidships and her foreholds are badly damaged. A variety of explanations, including a possible derangement of the compass, have been suggested as possible causes of the accident, but comment is reserved until official reports are at hand.

than \$200,000 a year ago, and this without quadruple expansion engines or water tube boilers.

Preliminary arrangements were made at a meeting in Cleveland, a few days ago, for the transfer of the Wheeler ship yard in West Bay City to the American Ship Building Co. A meeting was arranged between President Brown of the consolidated companies and Mr. F. W. Wheeler, and it is understood that Mr. L. M. Bowers of the Bessemer Steamship Co. also took a very important part in the negotiations, on account of the extent to which his company became involved in affairs of the West Bay City yard through the failure that occurred while three Bessemer ships were under construction. The Wheeler plant is to be appraised as soon as possible by Robert W. Hunt of Chicago and Robert Logan of Cleveland, who placed values on all the plants in the consolidation. Mr. Wheeler has everything arranged to take up in full all the bonds and other outstanding indebtedness, but there will probably be quite a struggle over the price at which the yard is to be taken over by the big company. Definite lines, have, however, been laid down for arriving at a purchase price, and it is more than probable that the negotiations will be concluded in a manner satisfactory to all interests. New stock will be issued by the American Ship Building Co. for the purchase of these works as well as for other additions to the consolidation that are contemplated.

A Chicago correspondent says: "Everybody connected with the Chicago Ship Building Co., or having business with the ship yard here, is pleased with the announcement that there is to be no disturbance in

or in temporary possession of this government will be kept in good condition pending the appropriation of a fund by congress sufficient to increase the facilities and maintain them in working order. It is believed to be possible to make use of the emergency fund for this purpose, but Secretary Long does not see his way clear to make drafts upon that appropriation. Next year's estimates from the navy department will embrace liberal provision for the present and prospective navy yards and stations in Cuba and Porto Rico.—Army and Navy Register.

Prof. Lewis M. Haupt of Philadelphia, one of the Nicaragua canal commissioners, is quoted as saying: "If the canal were finished now the total tonnage that would pass through it would aggregate in twelve months over 3,000,000 tons, of which the United States would contribute about 1,900,000, England, 1,100,000, France, 170,000 and other countries 50,000. The value of the tonnage and the trade affected would be nearly \$500,000,000. The greatest benefit would accrue to the United States, and the saving effected in three years would probably equal the cost of the canal."

A difficult tow has been undertaken by the tug M. E. Luckenbach from New York to Cartagena, United States of Columbia, a distance of 3,000 miles. The tow will be made up of the dredge Margaret and the small steamer Nellie Gazzam, recently completed at Hillman's ship yard, Philadelphia, for the American Gold Dredging Co. The dredge is 90 feet in length, while the Gazzam has a length of 65 feet.

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Discussion regarding the availability of the monitor and its place among naval vessels will not down. It has, in fact, been carried on with unusual interest since the last meeting of the Society of Naval Architects and Marine Engineers in New York. In a recent interview Admiral Bunce, who took the monitor Monadnock from New York to San Francisco, declared that there was no reason on earth why ships of this type should not be as fast or nearly as fast as the fastest battleship. He further asserts that as far as living quarters for the officers and crew are concerned a monitor may be made as comfortable or nearly so as any other war ship; that the coaling capacity is not necessarily limited and that the supposed instability of the gun platform is simply a matter of size and construction. Finally Admiral Bunce said: "Build the monitor on ampler lines and almost every objection urged against it will disappear. Take away most of the high freeboard of one of our first-class battleships and all the superstructure between the great turrets and you have a monitor relieved of ponderous weight, vastly cheaper, and ship to ship, equally powerful, if not more so." Commander Bunce holds that the monitor has the fighting qualities of a battleship without the detriment of a larger exposure of surface to the enemy and hence would be in a position to engage at close quarters under more favorable conditions. He does not share the great apprehensions expressed as to sea-going qualities in these ships, believing that were hulls made larger and more coal capacity provided these objections would, to a great extent, disappear.

Vessel men of the lakes who know Gen. Wm. Ludlow and remember the fight he put up with the United States light-house board a few years ago over the lighting of the St. Mary's river, will be interested in following comparison made by a correspondent of the New York Evening Post between Gen. Brooke and Gen. Ludlow as brought out in their respective spheres in Havana: "Brooke is the embodiment of the cut-and-dried routine of military officialism; Ludlow is a man who has not the patience to untie troublesome knots when they can just as well be slit. Brooke's answer to every criticism of his official conduct has uniformly been the production of the papers in the case, showing that he had intrenched himself securely behind precedents, and done everything according to rule; Ludlow, wherever he has been, has made his individuality so pronounced as fairly to take away the breath of the bureaucrats. The light-house board is still at work straightening out some of his transactions while he had charge of a district in its service. The transactions were perfectly creditable in themselves, but they were sometimes in flat defiance of instructions, and required the officer performing them to take upon himself a pretty heavy financial responsibility. The board would decide that a light-house should be put in a certain place, but Ludlow would pick out another site which he thought better, and would proceed to build there, unless stopped in time. All the work he did was excellent, and the government got its full money's worth, but mere questions of routine played no part in the transaction."

Gen. Dumont of the steamboat inspection service says very positively that there is no politics back of the investigation of charges preferred against Local Hull Inspector Charles A. Richardson of Chicago by Lieut. W. J. Wilson of the Chicago Nautical School. In the interest of the service generally, and in fairness to inspectors everywhere throughout the country, let us hope that Gen. Dumont will take pains to prove conclusively in connection with his findings in this matter, whatever the decision may be, that politics have had nothing whatever to do with it. Satisfied with the assurance under civil service rules that attention to duty is to be rewarded by permanent positions, the local boards of the steamboat inspectors have been steadily improving of late, and when it is charged, as in the Chicago case, that political influences are again working into the service, something definite should be had in the way of a denial of such statements. Conclusive evidence along this line would be welcome from Gen. Dumont. Let the Chicago inspector be judged on the score of whether he has wilfully discriminated against applicants for license because of their connection with the Chicago school, and let it be proven that there is no politics whatever in the matter.

It is reported from Washington that Mr. Alfred Noble of Chicago and Major T. W. Symons of the United States engineer corps, stationed at Buffalo, are among new members to be added to the Nicaragua canal commission. Both are engineers who have been prominently connected for a great number of years past with big waterway projects. Virgil G. Bogue and Geo. L. Morrison, who are also well known among civil engineers, are mentioned as other new members of the commission. Admiral John Walker is quoted as saying that the estimated cost of the canal as fixed by the old commission, which has finished its report, is \$125,000,000, the mean between estimates of the individual members.

A telegraphic report from Washington is to the effect that information has been received there that the Midvale Steel Co. of Pennsylvania, will bid for furnishing the armor required for the new armored vessels, and that the company will offer to place the armor at the required points within the limit of cost prescribed by congress, which was \$300 per ton. The material on which the Midvale company would bid would aggregate 24,000 tons.

SCARCITY OF VESSELS ON THE PACIFIC.

An excellent criterion of the universally existent conditions in the American merchant marine and the contributory ship building industry is afforded by the comment of the American Lumberman upon trade conditions on the Pacific coast. The Lumberman says:

"The Pacific ocean trade, whether coastwise or foreign, is somewhat hampered by lack of vessels. There has been a wonderful expansion within the last year of the demand upon carriers; the government has diverted some vessels to its own uses; within the last two years the Alaska business has called for a quite heavy amount of tonnage; the acquisition of the Hawaiian islands and the Philippines has made a demand for freight carriers, and there has been a growing demand for vessels in the China trade. The demand, therefore, in the aggregate has increased much faster than the supply of bottoms; and it has not been easy to re-enforce it from the Atlantic for the reason that the Atlantic trade is so good that special inducements have to be offered to divert carrying capacity to other waters.

"The lumber trade feels this condition somewhat. Coastwise trade is to a certain extent hampered by the diversion of both steam and sail carriers to other business. Even some small schooners which formerly were in the coastwise trade from Columbia river or Washington ports to California have found that they are able to cross to Hawaii, Australia, Japan or China, and are doing so. The demand for tonnage on the Pacific promises steadily to increase from now on with the growing influence of the United States and the opening of practically new countries to American commerce. It is to be hoped that the demand can be supplied by American-built vessels and that the ship building industry of the coast will reap a benefit from the changed conditions. Lumbermen are likely to have a large share in whatever business there is on the Pacific and they are especially interested just now in the vessel supply.

SHIP BUILDING IN GREAT BRITAIN.

During April Scotch ship builders launched twenty-five vessels of 40,886 tons gross, as compared with thirty-three vessels of about 57,135 tons gross, in March, and thirty-three vessels of 46,206 tons, in April last year. For the year so far 100 vessels, of about 158,826 tons, have been put into the water, against 128,756 tons in the corresponding period of last year, 90,531 tons in 1897, 140,112 tons in 1896, and 91,106 tons in 1895.

During April English builders launched eighteen vessels of about 45,768 tons gross, against thirty-one vessels of about 89,705 tons gross in March, and thirty-four vessels of about 87,652 tons in April last year. For the four months English builders have launched ninety-nine vessels, of about 248,632 tons, against 105 vessels, of about 235,886 tons gross in the corresponding period last year.

For the year so far there has been launched in the United Kingdom 203 vessels, with a tonnage of 448,015 tons gross, as compared with 218 vessels, of about 398,392 tons gross a year ago, and 201 vessels, of about 301,240 tons in 1897.

NAVAL ARCHITECTURE.

A book especially suited to the advancement of young men employed in ship yards is "Naval Architecture," a manual of laying-off iron, steel and composite vessels by Thomas H. Watson. The author is lecturer on naval architecture at the Durham College of Science, Newcastle-on-Tyne, England, and therefore well qualified for the compilation of a work such as this, which has been written to meet a need among junior ship draughtsmen, apprentice loftsmen and class students. It has been sought to make the subject clear by graphic sketch and every-day ship yard language. To avoid repetition, but scant attention has been accorded the subject of the laying-off of war vessels on the loft floor, although attention has been given to the explanation of some of the more prominent parts which distinguish this class of work. The work is profusely illustrated and handsomely bound. Published by Longmans, Green & Co. of New York and London.

A book of rare interest to vessel men could very probably be made up of the correspondence that passed between George L. McCurdy of Chicago, representing the underwriters, and W. C. Richardson of Cleveland, representing the owners of the steamer J. H. Outhwaite and consort, H. A. Barr, which are again about to go into commission after a year of idleness due to differences regarding insurance that followed an accident in which they narrowly escaped total loss on Lake Huron. A legal fight of a very bitter nature was promised in connection with this loss, but now that it has been settled it seems that all parties to the controversy have buried their differences completely, as is usual in matters of this kind. It is understood that the owners of the vessels get \$26,500, with their ships returned to them under conditions that will permit of insurance equal to the best that is granted wooden vessels. A tow of this kind, free from freight contracts on account of having been out of the market when low freights were the rule, ought to make \$12,000 or \$13,000 during the present season.

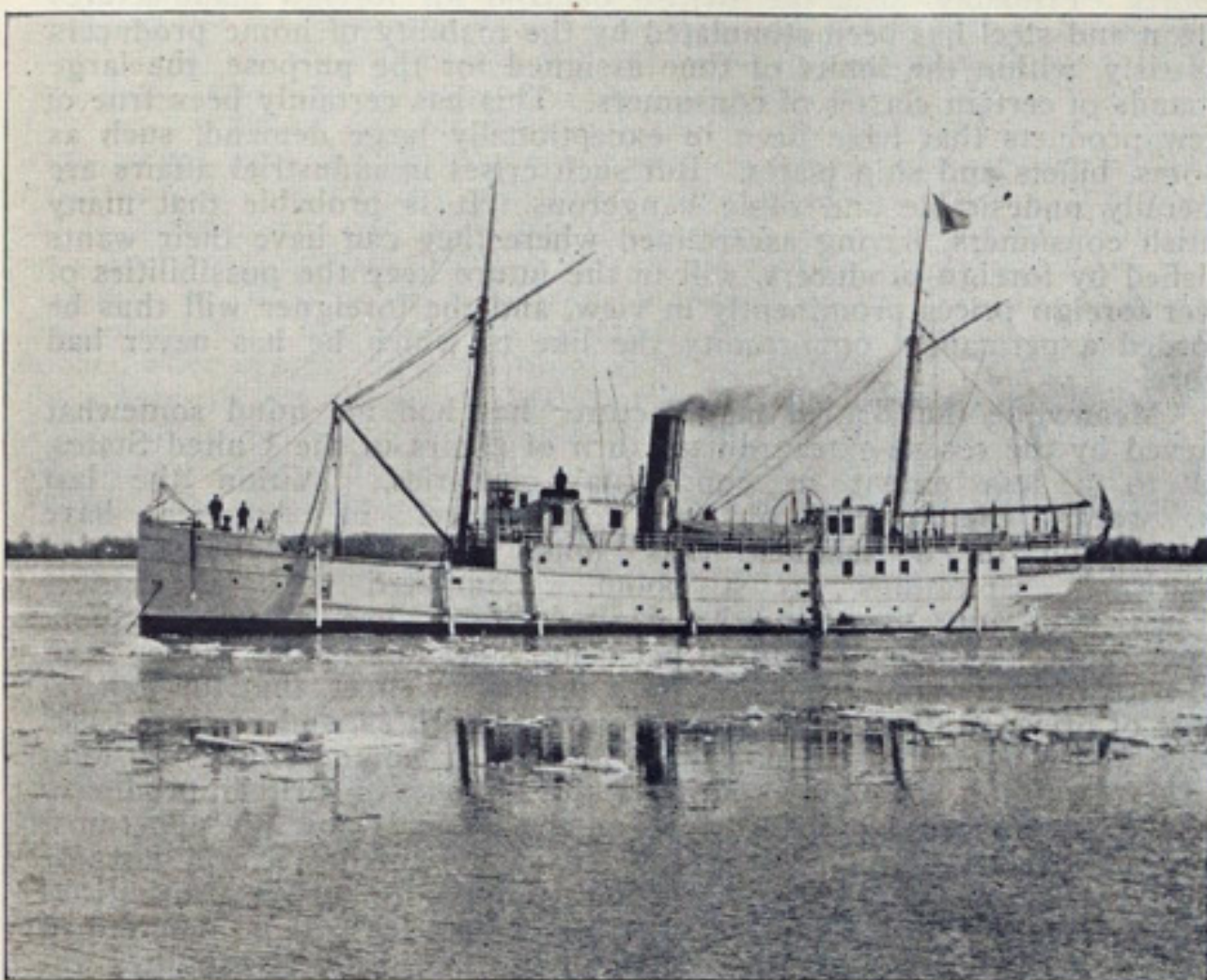
It is not probable that the gunboat Viking, formerly the yacht of that name, will be sent to Central American waters for patrol duty, as was intended by the navy department. A survey made of the Viking has shown that it will cost \$20,000 to put her in condition for that service. Under a law of congress naval vessels can not be repaired when the expense of making the repairs will amount to more than 20 per cent of the original cost. The Viking was purchased April 22, 1898, for \$30,000, and the estimate of the cost of repairing her is therefore greatly in excess of 20 per cent of the purchase price. The secretary of the navy has referred the question of the advisability of putting her in condition to the board on construction. Should the board decide that she should be repaired, it will be necessary to secure the authority of congress to do the work. Otherwise she will be sold.

Capt. M. De Puy of New York, owner of patents on the Paragon boiler, has closed an arrangement with the Marine Iron Works of Chicago for the manufacture of the boiler on a shop-right lease covering a term of five years.

LIGHT HOUSE CRAFT.

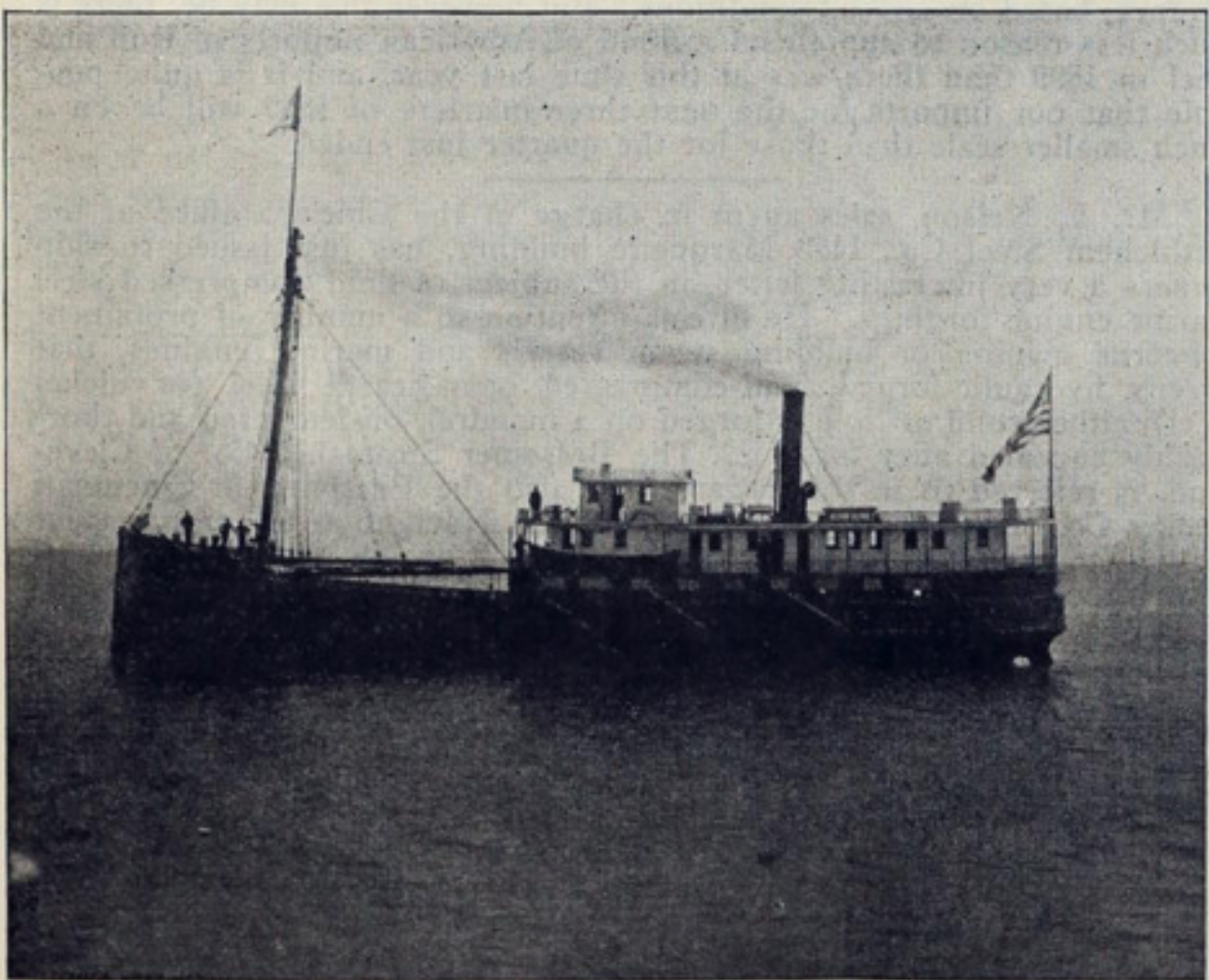
TENDERS AND SUPPLY SHIPS NOW IN SERVICE ON THE GREAT LAKES—THE NEW TENDER FOR WHICH PLANS WILL SOON BE PREPARED.

A letter from the Washington correspondent of the Marine Review states that he is informed by Naval Secretary Seth M. Ackley of the light-house board that the work of preparing plans for new light-house tenders for service on the great lakes will be begun in the near future. He stated that the inspectors in charge of the various districts had been written to with a request that they submit recommendations and suggestions for the vessels and that as soon as they are heard from the preparation of plans will go forward. The need of more light-house tenders and supply boats on the great lakes has lately been impressed upon the vessel interests in



LIGHT HOUSE TENDER MARIGOLD.

many ways, probably the most emphatic of which was the denial of the request of the committee on aids to navigation of the Lake Carriers' Association for several much needed buoys, on the ground that there was no tender available that could be utilized in caring for them. That the work imposed on the vessels now in service has been unduly arduous has been conclusively demonstrated. In the ninth district, for instance, the tender Dahlia, an iron side-wheeler steamer, built in 1874 and of about 333 tons burden, steamed 12,437 miles on a consumption of 644 gross tons of coal. The Dahlia has been extensively improved during the past year or so, the rigging having been shortened and repaired, new steering gear



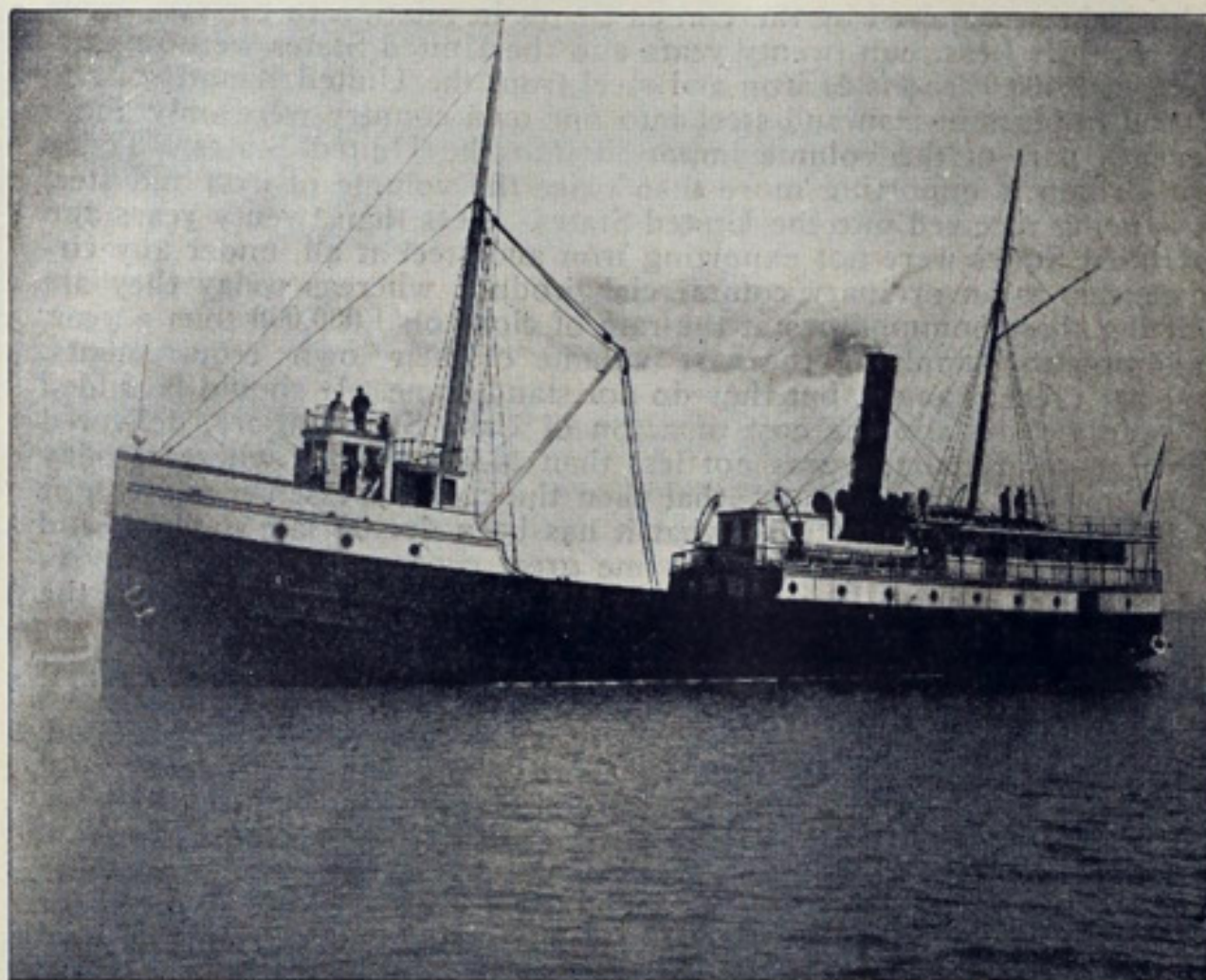
STEAMER WARRINGTON OF UNITED STATES LIGHT-HOUSE SERVICE.

provided, etc., as well as a new deck house and new pilot house. The tender is, however, entirely too small and too slow for the work of the district. When making a trip with supplies it is necessary to crowd the holds, gangways and living spaces, and consequently the provision of additional facilities are impatiently awaited. To add to the inconvenience there is now no tender for the engineer service of this district, which was formerly performed by two tenders under the direction of the engineer station at Detroit. One the vessels, the Warrington, has been transferred to the engineer of the tenth district and is stationed at Buffalo, while the increasing work of the ninth and eleventh districts has made it necessary

to detail a separate officer as engineer of the ninth district, and this official, who is stationed at Milwaukee, feels the imperative need of a steamer to attend to aids to navigation on Lake Michigan and Green bay.

A vessel which should certainly be replaced by a more modern craft is the Haze, now in the service of the tenth district. She is a wooden side-wheel steamer, built in 1876, and is of about 274 tons burden. Extensive repairs were made in 1895-96 and again in 1898, and considering that the vessel is 22 years old she is in fair condition, but is totally inadequate for the extensive work of the district. The Warrington, referred to above, is a wooden steambarge of 300 tons burden, and was built in 1868. She has been practically rebuilt within the past few years.

Perhaps the best of the lake tenders is the Marigold which is in the service of the eleventh district. She was built in 1890 and is of about 450 tons burden. Some idea of her capacity may be gained from the state-



STEAMER AMARANTH—TYPE OF LAKE LIGHT-HOUSE TENDER.

ment that during the season of navigation in 1898 she steamed 16,275 miles and consumed about 860 tons of coal. The work of the Amaranth embraced service in both the ninth and eleventh districts, and in the aggregate she steamed about 12,055 miles on a consumption of 990 net tons of coal. The Amaranth is a steel vessel, built in 1892, and is of about 744 tons burden.

EFFORT TO POSTPONE BIDS ON THE CRUISERS.

Commenting on events that have transpired recently in the navy department the Washington correspondent of the New York Sun says:

"Strong pressure is being exerted on the navy department to postpone for the present requests for bids on the six new unprotected cruisers authorized as a part of the programme of naval increase at the last session of congress. All the leading ship yards of the country which have heretofore entered the competition for constructing warships have now so enormous an amount of work on hand, both for the government and the merchant service, that their plants are said to be practically incapable of undertaking additional contracts, and therefore they are apprehensive that if bids are called for the building of new vessels some of the minor firms, which have not been considered as probable competitors, may submit proposals acceptable to the navy department, and thus secure awards, although inexperienced in the science of war ship building. While the failure of the government to secure terms for supplying armor within the provision of law limiting the price to be paid for it practically prevents the asking of bids for the battleship and armored cruiser class, there is nothing of this character to interfere with the building of the smaller ships when designs have been completed.

"It is recognized by the naval officials that only three ship yards in the country have the plant, experience and capacity for building larger vessels of the navy, but that there are a number of smaller firms competent to construct unprotected vessels is not questioned. The war is in a large measure responsible for the activity prevailing at the various ship yards. The purchase by the government of practically all the high speed and heavy displacement merchant ships for auxiliary cruisers led at the conclusion of peace to large orders for the construction of vessels to take their place. A majority of the ships purchased have been retained by the government. Commercial interests also have been interested in the establishment of new steamship lines between this country, Cuba and Porto Rico, and to supply the steamers for the various systems many orders have been given in the past six months for the building of merchant ships to engage in this trade."

It was stated in an article in the last issue of the Review referring to the suit of Miller, Bull & Knowlton of New York, against the Bath Iron Works of Bath, Me., that the steamer Winifred, built at Bath a short time ago, cost \$160,000. Some injustice may have been done the New York firm on account of this statement. We are informed that the bare boat, according to contract, cost \$169,000, and that with extras, fittings and passenger accommodations, the price of the ship complete was \$190,000, with no commissions of any kind added.

A change of address to 23rd street and Allegheny river is noted by the Armstrong Cork Co., manufacturers and importers of Pittsburg.

IRON TRADE COMPETITION.

REVOLUTIONARY MOVEMENTS IN THE UNITED STATES PROVE SERIOUS FOR
BRITISH MANUFACTURERS—SIGNIFICANT ARTICLE FROM THE LONDON
TIMES—BRITISH RAIL INDUSTRY ONLY A SHADOW OF ITS FORMER
SELF—DIMINISHED EXPORTS AND ALARMING INCREASE OF
IMPORTS—TEMPORARY RELIEF IN VIEW OF HIGH
PRICES NOW PREVAILING IN THE UNITED STATES.

"The iron trade is full of surprises and changes—more so, perhaps, than any other industry of modern times," says the London Times. "Whether in imports or exports, progress or regress, costs or prices, home or foreign markets, new and often unexpected features are continually coming to the front. This is especially true of the position that has lately been acquired by the United States in relation to the iron trade of the world. Less than twenty years ago the United States were importing about 1,500,000 tons of iron and steel from the United Kingdom, and the total imports of iron and steel into our own country were only about a seventh part of the volume imported into the United States. Today Great Britain is importing more than twice the volume of iron and steel that is being received into the United States. Less than twenty years ago the United States were not exporting iron and steel at all, under any circumstances, as an ordinary commercial product, whereas today they are exporting these commodities at the rate of close on 1,000,000 tons a year, in addition to supplying the vast volume of their own requirements. These are great changes, but they do not stand alone. It should be added that twenty years ago the cost of a ton of Lake Superior ore, delivered at furnaces in Pittsburg, was not less than \$6.00 to \$7.50, whereas today it is not one-half of that amount; that then the cost of Bessemer pig iron at Pittsburg was more than twice what it has been during late months, and that the price of steel rails at the same great center of production averaged over \$50 per ton, against \$15 to \$17 quoted for export during the greater part of last year.

"These revolutionary movements have tended to bring about great changes in the export conditions of both Great Britain and the United States, and in the influences by which they are controlled and regulated. It amounts, in short, to this, that our prices and exports alike are not entirely fixed by home or continental competition, as they used to be, but by the prevailing tone of the markets and the industrial situation generally in the United States. That country has such a vast production of all descriptions of iron and steel that it may at any time swamp our own relatively unimportant supplies. No amount of activity in our own home demands will now suffice to raise prices to the giddy heights of 1873 and 1880. No amount of combination and united effort on the part of British iron and steel manufacturers can now guarantee that prices can be kept at a predetermined level, unless they are prepared to risk the possibility of entirely losing the trade. The recent history of the rail trade is a notable case in point. A combined effort on the part of British rail manufacturers to keep up the price of heavy sections to a minimum of £4 10s. per ton has resulted in the partial ruin of that branch of business, the Americans having in 1898 taken orders for rails to the extent of nearly 300,000 tons, which, under the former regime of a free-fighting, untrammelled trade, would probably have chiefly come to Great Britain, but at prices that could yield no possible profit. Today the British rail industry is a shadow of its former self, and our rail exports for the first quarter of the present year were at the rate of only about 360,000 tons a year, or very little ahead of the actual rail exports in 1898 of the United States, which less than ten years ago did not export any rails at all.

"The situation is truly serious for British manufacturers, who are asking themselves two fundamental questions—the first, whether American competition must inevitably regulate in the future the British exports and prices of iron and steel; and the next whether, if so, it is worth while to struggle on under such overmastering incubus. Hitherto British manufacturers have been persuaded to keep on their business through prolonged periods of bad trade in the hope and expectation (which has now and again been realized) that a comparatively short period of high prices and large demand might compensate for years of poor results. This actually happened in 1873-74, in 1880-81 and in 1890-91. It has happened to a more limited extent, mainly because of the incubus referred to, in 1897-98, and it may be said to be happening still. But the outlook, nevertheless, is far from satisfactory. Our export trade is in a parlous state, and is threatened with at least partial annihilation. Despite the universal demand for iron and steel that is now prevailing, the volume of British exports for the first quarter of the present year has fallen by nearly 20 per cent. compared with the corresponding exports of two years ago. The total volume of our iron and steel exports for the period named has been at the rate of nearly 2,800,000 tons a year, whereas in previous periods of good trade our actual iron exports have considerably exceeded 4,000,000 tons. It is pleaded, and with some amount of truth, that the total production of iron and steel in Great Britain is not actually less than formerly, and that after this, after all, is the main thing. No doubt the fact is so, but can anyone guarantee the permanence of the present unprecedented home demand, and if it falls to normal proportions, what is to become of our iron and steel industries with the attenuated export trade that appears to lie in the future?

"It is not alone the diminished export trade that causes anxiety. There is something even more sinister and alarming in the extraordinary increase of our imports of iron and steel from other countries, and in all that it involves. This is an aspect of the industrial situation that has not hitherto received the attention it deserves. It is among the things not generally known that our imports of iron and steel have lately been advancing by leaps and bounds, and now represent an annual total of over 760,000 tons in volume and nearly £6,000,000 in value. Put in another way, the value of our imports of iron and steel is likely this year to be nearly one-third of the value of our iron and steel exports if the figures for the first quarter are maintained. This is an almost entirely new phase of our international trade in these commodities. It is true that Great Britain has always imported more or less iron and steel from other countries, but up to a comparatively recent date our imports mainly took the form of Swedish bar iron for our crucible-steel industry, and

were, therefore, rather of the nature of a raw material than that of a manufactured article. If we go back to 1860, we find that 54,000 tons of imported iron, out of a total of 57,000 tons of all kinds, assumed this form, and even so recently as 1877 42,000 tons out of a total import of 125,000 tons were in the same category. But in the first quarter of the present year not more than 14,376 tons, out of a total of 190,916 tons of all descriptions of iron and steel imported into Great Britain, took the form of bar iron. The remainder has almost wholly been manufactures of iron and steel which come into direct competition with what we produce at home. This means, in short, that we are now importing iron and steel manufactures for use in our own home industries at the rate of close on 800,000 tons a year, in direct competition with British producers of the same kind of commodities, either because the imported material is cheaper, or better, or cannot be produced at home exactly of the character and qualities required. Probably all three conditions have influenced, and continue to influence, the present gigantic scale of our imports. Probably, also, the British demand for foreign manufactures of iron and steel has been stimulated by the inability of home producers to satisfy, within the limits of time assigned for the purpose, the large demands of certain classes of consumers. This has certainly been true of a few products that have been in exceptionally large demand, such as blooms, billets and ship plates. But such crises in industrial affairs are generally undesirable and often dangerous. It is probable that many British consumers, having ascertained where they can have their wants satisfied by foreign producers, will in the future keep the possibilities of lower foreign prices prominently in view, and the foreigner will thus be afforded a permanent opportunity the like of which he has never had before.

"Meanwhile the British manufacturer has had his mind somewhat relieved by the recent extraordinary turn of affairs in the United States, and to a less extent in continental countries. Within the last few weeks the prices of iron and steel in America have been rising in a manner that must satisfy even the average American's aspirations for a boom. Compared with the prices of last year, pig iron in the United States has advanced about 50 per cent., steel billets about 40 per cent., steel rails about 35 per cent. and wire rods about 25 per cent. This means, in effect, that the general range of prices in the United States is now as high as, and in some cases above, those quoted in Great Britain for similar commodities. So long as this condition of affairs continues the anxiety of British producers is materially allayed, but the duration of the boom is now the uppermost topic of concern. Opinions are divided as to whether it will last for a few months only or whether it will have a much longer life. Authorities on both sides of the Atlantic believe that the matter will be determined by the possibilities of pig iron production, and that those possibilities will be controlled by the available supplies of ore for American furnaces. At the present time these furnaces are mainly dependent on the ores of the Lake Superior region, which in 1898 provided the raw material for a production of nearly 8,000,000 tons of pig iron, or close on 70 per cent. of the total quantity produced in the United States. This region has shown great possibilities of rapid development in the past. Within ten years it has increased its total output from a little over 7,000,000 to upward of 14,000,000 tons a year. Last year its possible production in high grade ores was taxed severely, and its capability of increased output in 1899 is regarded as small. If ores are abundant prices are likely to remain pretty low. If ores become scarce, or if there is a general apprehension that they may be so, prices are likely to advance, and perhaps to a higher figure than is now anticipated. An abnormal advance, founded on panic conditions, could hardly last so long as a moderate advance, based on normal conditions. But however this may be, there is much less reason to apprehend a flood of American imports of iron and steel in 1899 than there was at this time last year, and it is quite possible that our imports for the next three quarters of 1899 will be on a much smaller scale than those for the quarter just ended."

Mr. E. Nelson, sales agent in charge of the Chicago office of the Bethlehem Steel Co., 1433 Marquette building, has just issued to ship owners a very interesting letter on the subject of fluid compressed steel marine engine forgings. He directs attention to a number of prominent concerns owning or building steam vessels and marine engines that specify hydraulic-forged fluid-compressed open-hearth steel (or nickel steel), either solid or hollow-forged on a mandrel, oil-tempered and thoroughly annealed after forging. The Bessemer Steamship Co. of Cleveland, is referred to in this regard, and also the Pittsburg & Cincinnati Packet Co. of Cincinnati, and the California Navigation & Improvement Co. of Stockton, Cal. A shaft recently broken on one of the stern-wheel steamers of the St. Louis & Mississippi River Valley Transportation Co. of St. Louis, has just been replaced by the Bethlehem company. The new shaft is of solid nickel steel, hydraulically forged and thoroughly annealed. The tow boat King, now building at Jeffersonville, Ind., for the United States engineer at St. Louis, will have shaft, cranks, piston rods and wrist pins made of hydraulically-forged and annealed open-hearth steel.

The magnitude of a number of recent wrecking jobs, notably those in connection with the recovery of the sunken Spanish cruisers at Santiago, lends especial interest to the comprehensive catalogue just issued by Andrew J. Morse & Son of 140 Congress street, Boston, Mass. All their specialties, including particularly those for use by divers, wreckers and contractors, are listed and illustrated. The Morse diving apparatus has been for some time past the standard for use in the United States navy, and is in service in the United States engineer department and by the leading wrecking companies. The firm is at present giving especial prominence to their patent indicating gauges, which denote the air pressure and depth of the diver, and to the patent automatic respirator, of which more than 15,000 are already in use.

The Long & Allstatter Co., Hamilton, O., is making additions to its foundry, which, when completed, will be 206 feet long, with two 30-ton cranes traveling the entire length. There will be additional core ovens, rooms for sand, supplies, etc., all under one roof.

A TRIM SIDE-WHEELER.

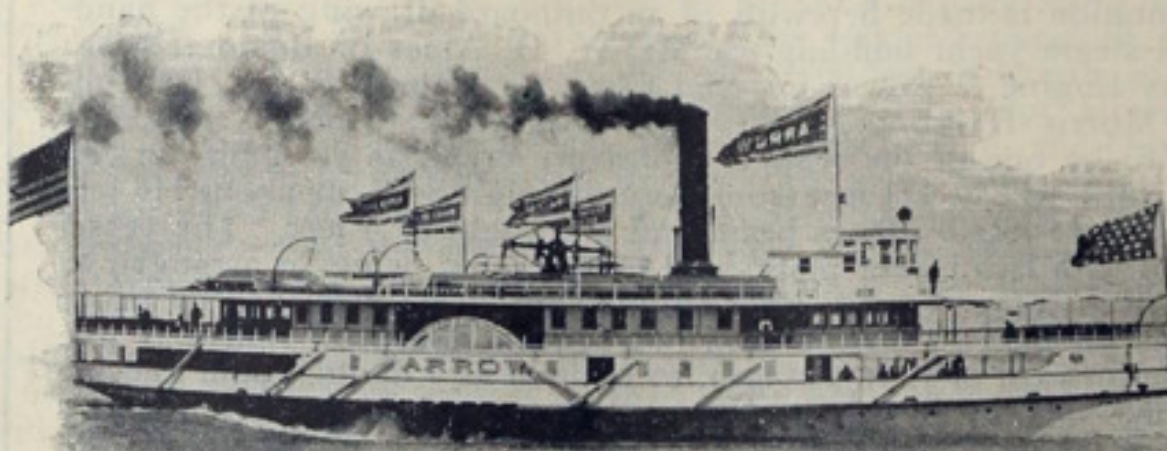
THE PENNSYLVANIA, CAPABLE OF A SPEED OF 20 MILES AN HOUR AND ELEGANTLY FITTED OUT, IS READY FOR SERVICE BETWEEN ERIE AND BUFFALO.

Detroit, Mich., May 24.—On Monday next the Detroit Ship Building Co. will deliver in Erie the side-wheel passenger steamer Pennsylvania, a day boat similar to the Frank E. Kirby, owned by Ashley & Dustin, of Detroit, and which is well known on account of the fast run she makes each day during the excursion season between Detroit and Put-in-Bay. The Pennsylvania will not be a 15-mile boat said to run 20 miles an hour. She will in reality be a 20-mile boat, and can attain that speed whenever it is required of her. She will leave here Sunday, going by way of the islands and Sandusky, and will give an excursion out of Erie Monday evening. On the short run between Erie and Buffalo it will probably not be necessary to put this vessel on a schedule of more than about 18 miles an hour. She will maintain that speed with ease. Erie will have reason to be proud of her. She will be as fast as either the City of Buffalo or City of Erie and will be by no means a small boat. Her license from the government inspectors will provide for about 1,200 excursionists. As her run calls for no night passages, space is not given up to staterooms, and with plenty of open deck and cabin room she will, therefore, accommodate a very large number of excursionists.

Mr. E. McFall, of Sandusky, manager of the Toledo & Island Steamboat Co., organized the company that owns this vessel, and has looked after everything pertaining to her construction. As he has spent his whole life on vessels of this kind he knew what was wanted for the Erie-Buffalo service, but he has gone further than to furnish a fast, substantial craft. He has exercised rare good taste in finishing the vessel. She is altogether a handsome craft without the slightest indication anywhere of an effort to save money in her construction.

The Pennsylvania is of steel, of the side-wheel type and of the following dimensions: Length, 214 feet; beam, moulded, 32 feet; depth, 12 feet. The paddle-wheels are 23 feet in diameter and are each fitted with nine feathering buckets of 9 by 4 feet surface dimensions. The engine, which is of the beam type, has a cylinder of 48 inches bore and 9 feet stroke, and is supplied with steam from two Scotch boilers, each 13 feet 2 inches diameter by 11 feet 6 inches long. The boilers are fitted with Howden hot draft appliances. This machinery is expected to develop about 800 horse power, and as the vessel is fine-lined and will

direction of Mr. Eugene McFall, the side-wheel steamer Arrow, is presented herewith. The Arrow was also built by the Detroit Ship Building Co., and has been in operation on a regular route between Sandusky and the islands of Lake Erie since 1895. She is 176 feet over all, 51 feet over guards, 28 feet hull beam, and 9½ feet depth. The hull is of steel and wheels are of the feathering type operated by a beam engine of the W. & A. Fletcher Co. make. There is one boiler fitted with

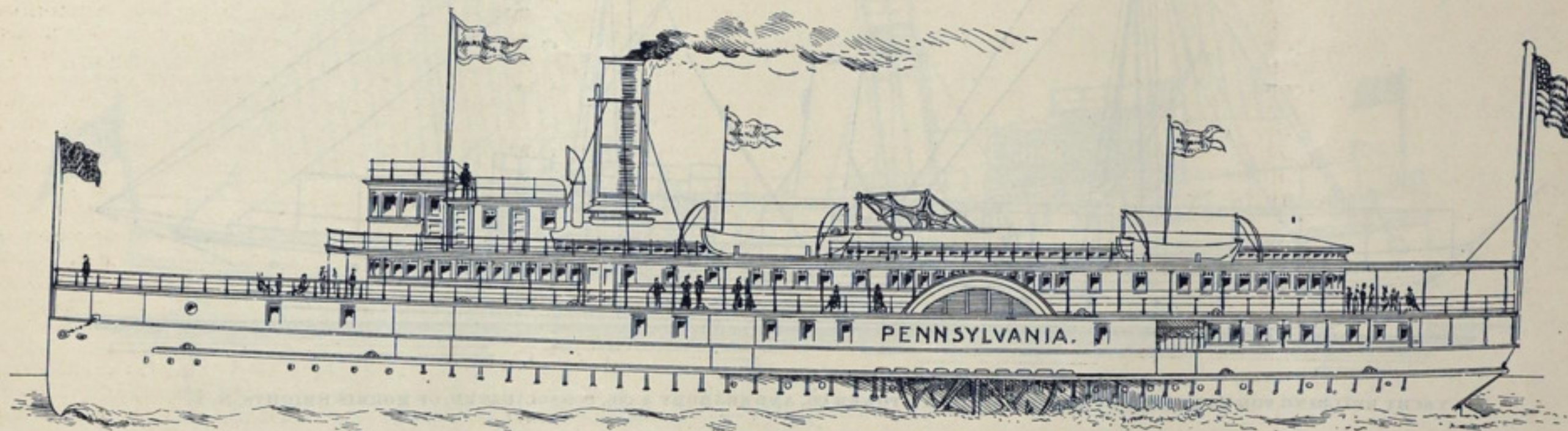


STEAMER ARROW, OWNED BY TOLEDO & ISLAND STEAMBOAT CO.

Howden hot draft. The Arrow is allowed 900 excursionists. Her cabins are nicely fitted in mahogany, and with some 150 electric lights, a search light and all the comforts for passengers that are provided on the best of the big steamers. She is also a favorite with the tourists that visit Lake Erie summer resorts.

A CHEAP FREIGHTER.

The first trip of the steel barge Aurania since she has been fitted with machinery will probably result in considerable figuring among lake vessel owners on the subject of tows. Her owner, John Corrigan of Cleveland, is greatly pleased with her performance, and it is probable that officials of the Detroit Ship Building Co. will be pleased also, as it has more than equaled their most sanguine expectations. With a cargo of only a few tons short of 5,000, and with 150 tons of fuel, the



A 20-MILE BOAT—NEW STEAMER PENNSYLVANIA FOR ERIE-BUFFALO SERVICE.

stand well up out of the water she will certainly be very fast. Everything in the way of auxiliary machinery is entirely modern. The electric light plant is of 400 16-candle-power-lights capacity.

Entering this vessel aft on the main deck the passenger finds the usual arrangement of vestibule, clerk's office, check room, etc. Just aft of this, on either side of an entrance to the dining room on the lower deck, are rooms for some of the officers and for the accommodation of lady passengers. The dining room is handsomely fitted in white and gold, with accommodations for about fifty, and just forward of it is a galley with swinging door connections and provided with everything in the way of cooking utensils that would be found on the largest of the passenger steamers. Leading up from the vestibule, or main entrance, to the upper deck is a broad stairway, with a casing of unusually fine workmanship, and a large mirror just in front of the upper landing. This upper deck is given up almost entirely to the main saloon, finished in mahogany and very nicely decorated. Here are the general accommodations for passengers, with entrances to the open deck spaces in bow and stern. There are some ten or twelve state rooms, well furnished, but these will probably not be used very much except in cases of sickness or during very unfavorable weather. The cafe or bar, finished in antique oak and one of the neatest parts of the ship, is well up in the bow, below the passenger deck, and removed entirely from the main cabin.

In this vessel are embodied improvements in plumbing and ventilating appliances that will make her the peer of any ship afloat from a sanitary standpoint. The entire system of plumbing is the best ever put into a vessel on the great lakes. Kenney flushometers are used throughout the closets. The adoption of this device is in itself a very marked advance in ship plumbing. It will undoubtedly be used on all new vessels when its advantages are fully understood. Improvements made in the McCreery ventilating system, which is also applied to Pennsylvania, will do away entirely with objections regarding impure air in the dining room or in other parts below deck. The new steamer will be commanded by Capt. Harry Tyrie, formerly on the steamer Metropolis, running between Toledo and Put-in-Bay. Joseph Wells is chief engineer and W. H. McFall, Jr., clerk.

A small illustration of another vessel built and operated under the

Aurania was drawing only 16 feet 4 inches leaving Toledo, a few days ago. She made the run from Fort Gratiot to Detroit, 225 miles, in 22½ hours, against a fresh north-east wind up Lake Huron. This assures 10 miles speed, loaded, for the vessel, and fully equals all that was expected when it was decided to equip her with machinery. With considerable strengthening of hull to secure a satisfactory insurance rating as a steel steamer, and with the full equipment of machinery added, the cost of the Aurania to her owners is about \$170,000, which is certainly a very low figure for a 5,000-ton freighter. Her triple expansion engines have cylinders of 17, 27½ and 47 inches diameter, with a common stroke of 36 inches, and she has two Scotch boilers, 12 by 13½ feet, fitted with Howden hot draft.

"The Scenic Route of America" is the very appropriate title adopted for the service of the Northern Transit Co. of Cleveland, which operates a semi-weekly line from Toledo and Cleveland on down the Welland canal, Lake Ontario and the Thousand Islands of the St. Lawrence, with connections for Montreal. The company has just issued a handsome pamphlet, copies of which may be obtained upon application to General Manager W. A. Collier at Cleveland, and in which the beauties of the route are described and illustrated. With the rapidly increasing popularity of the country bordering on the St. Lawrence as a summer resort, there is little doubt but that the capacity of the company's steamers Empire State and Badger State will be severely taxed many times during the season just opening. Certainly no more varied, interesting and enjoyable outing can be offered.

No calendar on earth has ever attracted more attention than the big calendar—very big—issued by Castner, Curran & Bullitt of Philadelphia, sole agents for Pocahontas coal. Now they are out with a small novelty, but a very attractive one, a match-safe in the form of a little book with very neat gold edges.

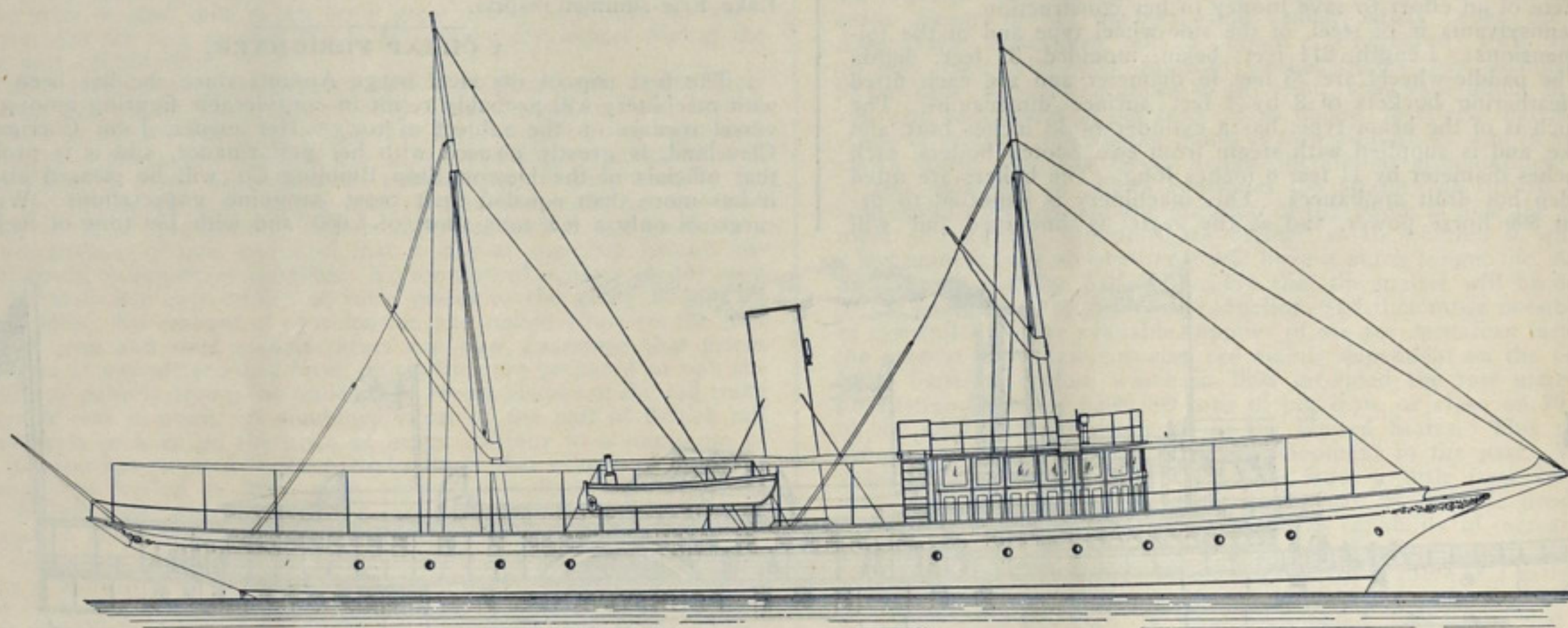
Maj. James Quinn, United States engineer at New Orleans, La., writes the Review that none of the concerns he has asked to prepare plans for a powerful dredge suitable for doing the government work at the mouth of the Mississippi river have as yet completed the work.

THE AMES YACHT.

A HANDSOME STEAM CRAFT OF MODERATE SPEED BUILDING BY THE GAS ENGINE & POWER CO. AND SEABURY & CO., CONSOLIDATED, OF MORRIS HEIGHTS, N. Y.—A RUSH OF WORK AT THE MORRIS HEIGHTS PLANT.

Presentation is made herewith of an outboard drawing of the handsome steel steam yacht building for Mr. W. H. Ames of Boston, Mass., by the Gas Engine & Power Co. and Chas. L. Seabury & Co., Consolidated, of Morris Heights, N. Y. The Ames yacht, which is generally conceded to be one of the trimmest pleasure crafts as yet built in an American yard, will be 111 feet from stern to knighthead, or about 116 feet over all, with 14 feet 6 inches beam and a draught of 5 feet. The vessel is equipped with two power plants and twin screws, being so arranged as to permit of the operation of either engine with steam furnished by either boiler, thus giving two distinct and independent systems. There is one deck house forward of 17 feet length, to be used as a dining room and for observation. On top of this deck house is the bridge. The owner's quarters are forward and consist of a large saloon, a stateroom for the owner extending over the full breadth of the vessel, and two large state rooms for guests, as well as a bath room. The latter and the saloon will be finished in polished white mahogany, while the state rooms will be in white enamel with gold trimmings. The crew's quarters are aft and are connected with a large galley. The yacht is expected to maintain a speed of 14 or 15 miles an hour.

The fleet of pleasure craft now under construction at the Morris Heights yard is rapidly assuming huge proportions. In addition to the Ames yacht there are building there several other steam yachts and a number of smaller craft. One of the former is the steel, twin-screw yacht



YACHT BUILDING FOR W. H. AMES BY THE GAS ENGINE & POWER CO. AND SEABURY & CO., CONSOLIDATED, OF MORRIS HEIGHTS, N. Y.

of 225 feet length, building for John P. Duncan of New York. A composite twin-screw yacht 135 feet in length, and which it is estimated will attain a speed of 18 miles, is building for Louis Bossert of Brooklyn, and a single-screw steel yacht of 145 feet length, engined for a speed of 16 miles, is building to the order of E. H. Blake of Bangor, Me. On the stocks also are a 100-foot wooden twin-screw yacht for Dr. F. L. Humphreys of Morristown, N. J., and a yacht of 80 feet length over all, to be driven by twin screws, for George M. Allen of New York City. This company is also building a total of seventy naptha launches, ranging in size from 18 feet upward. Of the seventy boats, sixteen will be used as tenders on the steam yachts above mentioned. The company is also working on an order for twenty-five steam tenders, each 30 feet in length, for use on the army transports now fitting out by the United States government, and four tenders of larger size—40 and 60 feet—for the naval reserve service. All of the work mentioned will, of course, be completed during the present season.

Referring to yachting matters in and around New York, the Sun says: "The Kanawha, a steamer for John P. Duncan, is the largest yacht building at the Morris Heights works. She will be of steel, 227 feet over all, 190 feet on the water line, 24 feet beam, 15 feet deep and 10 feet draught. Duncan sold his old yacht of the same name to the government last spring. The new one will probably be launched this month, but it will be some time before she is ready for service. Julius Fleischmann's Hiawatha will be a fast yacht, the builders guaranteeing 22 miles an hour. They expect that the Kanawha will exceed this speed. In model the latter looks very much like the old Kanawha, with improvements and refinement of lines that have suggested themselves to her designer. Her accommodations will be very complete. The Hiawatha is nearly ready for her owner to hoist his pennant for the season. Rear Commodore Edward P. Weston's steamer Wachusett is also being fitted out at Morris Heights and will go into commission at an early date. Among the others that are being got ready for the season are A. L. Pope's steamer Columbia, Charles M. Pratt's steamer Allegra, L. D. Fisk's steamer Owasco, W. B. Higgins' steamer Charlietta, J. Campbell Smith's Anabel, formerly Marguerite, and James Laughlin, Jr.'s yawl Flying Cloud, Colgate Hoyt's steamer Tide is in commission. This yacht was formerly known as the Alga."

A new packet to be operated between East Liverpool and Georgetown, Ohio, is nearing completion at the latter place. Dr. H. Navigo of Georgetown is principal owner of the new vessel.

FROM BATH SHIP YARDS.

NOTES REGARDING PROGRESS OF WORK ON A NUMBER OF NEW VESSELS, STEEL AND WOOD, IN THE NEW ENGLAND DISTRICT.

Bath, Me., May 23. (Spl. Correspondence)—The wooden five-masted schooner Henry O. Barrett was successfully launched from the yard of G. G. Deering. She is 250 feet in length, 44 feet beam, 22 feet depth, and of a gross tonnage of 1,850 tons. The vessel, the deadweight carrying capacity of which will be 3,300 tons, will be managed by her builders and commanded by Capt. A. P. Davis, of Somerset, Mass.

On Thursday May 11, Percy & Small, ship builders, launched the five-masted schooner M. D. Cressy. She is 264 feet 4 inches in length, 43 feet 9 inches beam and 21 feet 6 inches in depth, and of 2,114 gross or 1,884 net tons. This vessel will cost when completed in the neighborhood of \$85,000. She also will be managed by her builders.

Kelley, Spear & Co. a few days ago launched the Oxford, another of the barges building for the Staples Coal Co. The Oxford is 184 feet 9 inches in length, 35 feet 2 inches beam, 16 feet 2 inches depth and of 836 gross tons.

A few days later the New England Ship Building Co. of Bath, sent into the water barge No. 15, which is 200 feet in length, 35 feet beam and 17 feet depth, registering 800 tons, with a coal carrying capacity of 1,700 tons.

Monday May 29 has been set as the date for the launching of the torpedo boat Dahlgren at the yard of the Bath Iron Works.

The New York, New Haven & Hartford Railroad Co. will build two powerful steel tug boats of 118 feet length, 25 feet 9 inches beam and 16 feet 3 inches depth. The boats will be fitted with vertical compound engines with cylinders of 22 and 48 inches diameter by 36 inches stroke. Steam will be supplied by two steel single-ended Scotch boilers, 14 feet 6

inches in diameter by 12 feet long. These tugs will cost in the neighborhood of \$90,000 each.

The steel ship building at the yard of Arthur Sewall & Co. at Bath, is about one half in frame. She is a sister ship to the Arthur Sewall, built by the same firm last winter. William A. Fairburn, chief draughtsman of the Bath Iron Works, made the plans for these vessels, and has acted as consulting naval architect during their construction. Material has been ordered by Sewall & Co. for the steel barque which the firm will build during the summer. A crew of men is engaged in driving piles and making other preparations at the south end of the yard for laying the keel of the new vessel. Her dimensions will be: Length, 250 feet; beam, 42 feet; depth, 26 feet; draught of 21 feet 6 inches. This vessel will have two continuous laid decks with a poop and forecastle.

The large wooden barge New York, constructed for the Atlantic Transportation Co., and which is now lying on the stocks in the yard of her builder, William Rogers of Bath, will be sold at auction May 30.

Your correspondent is informed that Richard Stevens, for whom the Roach ship yard recently launched the steam yacht Aileen, has chartered the vessel for the coming season to W. H. Patterson of New York.

The summer meeting of the Institution of Naval Architects will be held at Newcastle-upon-Tyne and Sunderland on Tuesday, July 18, and the four following days. Papers have already been promised by Sir Andrew Noble, K. C. B., on "Naval Artillery;" Mr. P. Watts, on "Elswick Cruisers;" Mr. H. F. Swan, on "Ice-Breaking Steamers;" Mr. F. Marshall, on "The Boiler Arrangements of Some Recent Cruisers." A paper has also been promised by Mr. A. F. Yarrow, and a joint paper by Herr Otto Schlick and Mr. John Tweedy; the titles of these will be announced in the detailed program.

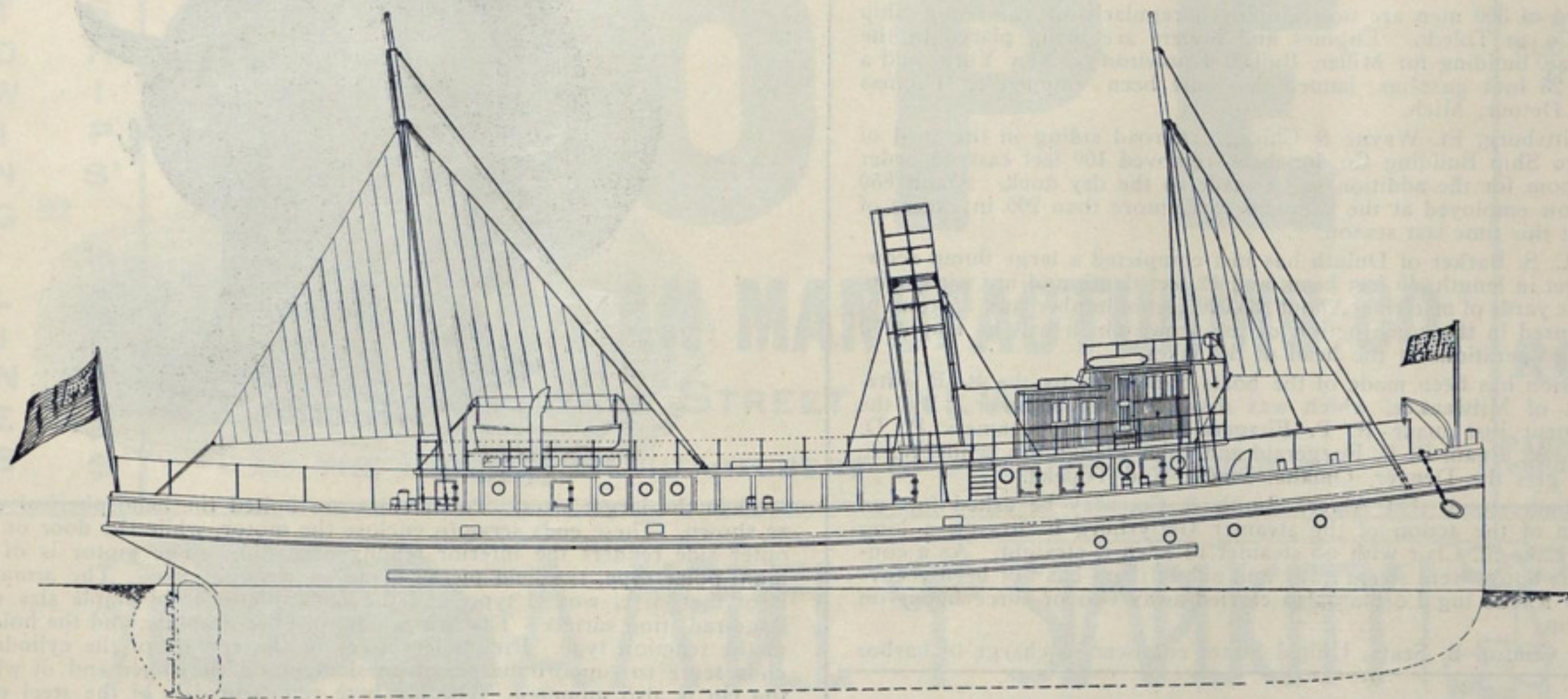
One dollar Sunday outings—Beginning Sunday, May 28, and until further advised, parties of five or more traveling together on one party ticket going and returning same day, may travel on any train of the Nickel Plate road to and from any station west of Wallace Junction, Pa., not more than one hundred miles from starting point, for \$1 for each person. Where single fare is \$1 or less, individual tickets will be sold going and returning same day at one fare for the round trip. Confer with ticket agents of the Nickel Plate road for further particulars.

SEA-GOING TUGS.

THE LAST OF THREE POWERFUL TOWING STEAMERS FOR THE CONSOLIDATION COAL CO. IS WELL ALONG TOWARDS COMPLETION AT THE YARD OF THE COLUMBIAN IRON WORKS, BALTIMORE—OTHER NEW VESSELS.

Baltimore, Md., May 23.—(Spl. Correspondence.)—Work is progressing rapidly at the yard of the Columbian Iron Works at Locust Point on the third of the steel sea-going tugs building for the Consolidation Coal Co. The Piedmont and Cumberland, which were delivered some time ago, were identical in dimensions and finish, while the vessel now on the stocks is about 8 feet longer. This third vessel is 149 feet over all, 142 feet between perpendiculars, 27 feet beam and 16 feet depth. She will have two pole masts and one smoke stack. Engines are of triple expansion type and of 800 horse power, with cylinders 16.24 and 41 inches by 30 inches stroke, to which steam will be supplied from two Scotch boilers 10 feet 6 inches diameter by 12 feet 4 inches in length, working at 160 pounds of pressure. The entire equipment of the tug will be essentially modern and will include an electric light plant, a Globe steam steerer and Hyde windlass and capstan.

At the Columbian works progress is also being made on the handsome steamer building for Hartford and New York service. She is 253 feet over all, 243 feet between perpendiculars, 47 feet beam over fenders, and 13 feet 3 inches depth, with five water-tight bulkheads. On the berth deck forward will be quarters for the crew and accommodations also for upward of one hundred steerage passengers. On the main deck aft will be located the ladies saloon, with freight space forward. The upper deck will be given up to a saloon and 66 staterooms, while the promenade deck will have the pilot house, captain's room and officers' quarters. White and gold will be the prevailing colors in the interior decora-



STEEL SEA-GOING TUG BUILDING FOR THE CONSOLIDATION COAL CO. BY THE COLUMBIAN IRON WORKS, BALTIMORE, MD.

tion. The steamer will be fitted with twin screws driven by engines of 20 and 40 inches diameter by 28 inches stroke. Steam will be supplied from four Scotch boilers, 8 feet 6 inches in diameter by 14 feet length, at a working pressure of 110 pounds. The equipment will include a Williamson steerer and an electric light plant capable of supplying 200 16-candle power incandescent lights and a 6,000-candle power search light.

The United States revenue cutter now building at the Columbian yard is fully two-thirds completed and the machinery is being placed in position. The torpedo boat Tingley is partly in frame. The vessels mentioned, together with the submarine torpedo boat Plunger, constitute practically all the work on hand at the present time.

PUSHING THE SHIPPING BILL.

Senator M. A. Hanna, author of the ship subsidy bill of the last congress, is making every effort to secure favorable consideration of that measure in Washington next winter, and what is still better, is endeavoring to keep the bill out of politics. Senator Hanna's latest move, and it is manifestly a commendable one, is an effort to interest the governors of western states in the bill, with the idea of having it brought up, discussed and if possible endorsed at the Trans-Mississippi Commercial Congress at Wichita, Kan. Mr. Hanna's letter on the subject, addressed to western governors, is as follows:

"You will find among the Pacific coast and Gulf states particularly, and in a number of interior states, a strong and growing desire to see American ships replace the foreign ships engaged in carrying our imports and exports, to which the people of this country are paying \$200,000,000 every year, every dollar of which goes to enrich foreigners at our expense. This is by no means a political, and least of all a partisan question. It is wholly an industrial question, just as much so as the improvement of our rivers and harbors is an industrial and commercial subject. If you should entertain these views, may I ask you to so express yourself to the delegates that you may appoint, or have appointed, to attend this session of the Trans-Mississippi Commercial Congress? If the delegates to that congress would take up and deal with this subject in a broad, national and friendly way, they would be most materially advancing the welfare of the whole nation, their own sections quite as much as those right on the seaboard."

WHERE SHIPS ARE BUILT.

NO DIMINUTION IN THE RUSH OF WORK AT THE YARDS ON THE ATLANTIC AND PACIFIC COASTS, THE GREAT LAKES AND THE RIVERS.

Machinery for two steamers building for the Lee line by E. J. Howard of Jeffersonville, Ind., will be furnished by the New Albany Mfg. Co. of New Albany, Ind. The vessels are designed for service between St. Louis and Memphis. One is 220 feet and the other 200 feet in length, each 42 feet beam and 6 feet depth of hold. The steamer which Capt. Howard is building for Capt. Cooley, for service between New Orleans and Ouachita river ports, will be a sister vessel of the America, being 140 feet in length, 32 feet beam and 4 feet deep. Carter & Bros. of Plaquemine, La., selected the Howard yard for the construction of their new vessel because of the satisfaction given by the U. & D., which they had built there last year. The new boat will be 155 feet in length, 28 feet beam and 3½ feet depth of hold. In addition to the vessels mentioned there are also building at the Howard yard three steel tenders for the United States government. Each will be 102 feet in length by 24 feet beam, and the contract price is in the neighborhood of \$54,000.

Mr. W. C. Sproul, vice-president of the Roach Ship Yard, Chester, Pa., and to whose energy and business acumen is largely due the unusual degree of success which that yard has recently attained, is credited with being the prime mover in a project for the establishment of a \$1,000,000 ship yard at or near Chester, Pa. Assuredly Mr. Sproul should have no difficulty in interesting all the capital he can make use of.

Moran Bros. Co., Seattle, Wash., have launched the steamer Alaska, building for the Empire Transportation Co. She is a peculiar flat-bottomed twin-screw craft, built entirely of steel. Work on Moran Bros. new

saw mill at the ship yard is progressing rapidly. The mill will be fitted with up-to-date machinery.

H. M. Bean of Camden, Me., has taken a contract for a six-masted schooner to be built for Capt. John S. Crowley of Taunton, Mass. She will be 340 feet over all, 300 feet keel, 420 feet from end of jibboom to end of spanker boom, and will carry 5,500 tons of coal. The vessel will cost when completed \$100,000.

Reid's ship yard, Toronto, Ont., has launched the Victoria, building for the Ottawa River Navigation Co. She is 100 feet long and 20 feet beam, is fitted with a compound engine and Fitzgibbon boiler and will have a speed of 14 to 15 knots. Her capacity is 300 passengers.

The scope of improvements contemplated by the Fore River Engine Works, Weymouth, Mass., has been broadened. It is now proposed to build a wharf 300 feet long and to also construct a basin 350 feet long, 175 feet wide and 10 feet deep for use in finishing large vessels.

Rumors continue in circulation to the effect that plans and specifications for four new steamers for the Ward line have been at the ship yard of Wm. Cramp & Sons Co., Philadelphia, for some time past and that contracts for their construction may be closed at any time.

The steamer described in the Review last week as building for the New Haven Steamboat Co. at the yard of the Maryland Steel Co. at Sparrow's Point, Md., will be named the Chester W. Chapin, after the president of the company.

A few weeks will see the completion of the steam yacht building at the ship yard of J. M. Bayles & Son, Port Jefferson, Long Island, N. Y., for W. J. Matheson. Most of the machinery is in place and the joiner work is well advanced.

A. J. Frisbie, Salem, Mass., is building a schooner 95 feet long, 70 feet water line, 23 feet beam and 3 feet draught for C. H. Jones, who will operate her in the Carolina sounds. B. B. Crowninshield of Boston prepared the plans.

So popular has the steamship line from San Diego, Cal., to Yokohama, established by the Santa Fe railroad, proven, that it is announced that three more steamers will be added to the service at once.

Paul Le Roux of Albany, N. Y., has laid the keel for a steamer 92 feet long to be built for the Albany, Castleton & New Baltimore line.

AROUND THE GREAT LAKES.

Log rafts containing more than 3,000,000 feet will, it is expected, be brought to Menominee this season.

Capt. J. W. Millen of Detroit claims credit for the original conception of the idea of a bow-screw ice-crusher.

Ranney & Co. have purchased the fishing tugs Helena and Ideal from the National Bank of Commerce, Cleveland.

A package freight and passenger steamer of about 1200 tons freight capacity and with accommodations for about fifty passengers is offered for sale or charter by W. G. Jenks, Port Huron, Mich.

The United States court of appeals at Detroit has issued an order recalling the mandate in the Ohio-Siberia-Mather case and issuing a new mandate including interest in favor of the Ohio people.

Edward Gillen, government inspector of harbor work, is making surveys and soundings of the river channel at Menominee with a view to the best expenditure of the \$24,000 appropriation made by the last congress.

Daily service on the Holland and Chicago line will open June 1 with the steamers Soo City and City of Holland. The Soo City has been thoroughly overhauled and the City of Holland has had her engines compounded.

George B. Carpenter & Co., Chicago sail makers, have within the past few days shipped to ex-President Dole of Hawaii a set of sails for his 50-foot yacht, and a set for a 35-foot yacht to Logan Bros. of Auckland, New Zealand.

Water in Portage lake is said to be fully 9 inches higher than it was a year ago and there is now a clear channel with 18 feet of water for the entire distance through the Portage lake waterways from Portage entry to the mouth of the ship-canal.

Upward of 300 men are now employed regularly by the Craig Ship Building Co. at Toledo. Engines and boilers are being placed in the steamer Mae, building for Miller, Bull & Knowlton of New York, and a handsome 25 foot gasoline launch has just been shipped to Thomas Burton of Detour, Mich.

The Pittsburg, Ft. Wayne & Chicago railroad siding in the yard of the Chicago Ship Building Co. has been removed 100 feet east, in order to make room for the addition to be made to the dry dock. About 850 men are now employed at the Chicago yard, more than 200 in excess of the force at this time last season.

Capt. C. S. Barker of Duluth has just completed a large dump scow. It is 135 feet in length, 40 feet beam and 12 feet depth and has a capacity of 700 cubic yards of material. About 235,000 feet of lumber and 35 tons of iron were used in the construction of the scow, which will be employed in dredging operations at the head of the lakes.

A division has been made of the boats controlled by the R. P. Fitzgerald Co. of Milwaukee, which was dissolved last summer. By the apportionment just made R. P. Fitzgerald takes the steamers P. D. Armour, W. M. Egan, R. P. Fitzgerald and John Plankinton, while W. E. Fitzgerald gets the Denver, Omaha, Pueblo and Topeka.

It is understood that Alger, Smith & Co. may be asked for an explanation of the action of the steamer Gettysburg in towing a long raft down Lake St. Clair with no steamer to keep it straight. As a consequence six buoys were swept away and one of them has not been recovered. The Ruelle tug Lorman also carried away two or three buoys on a recent trip.

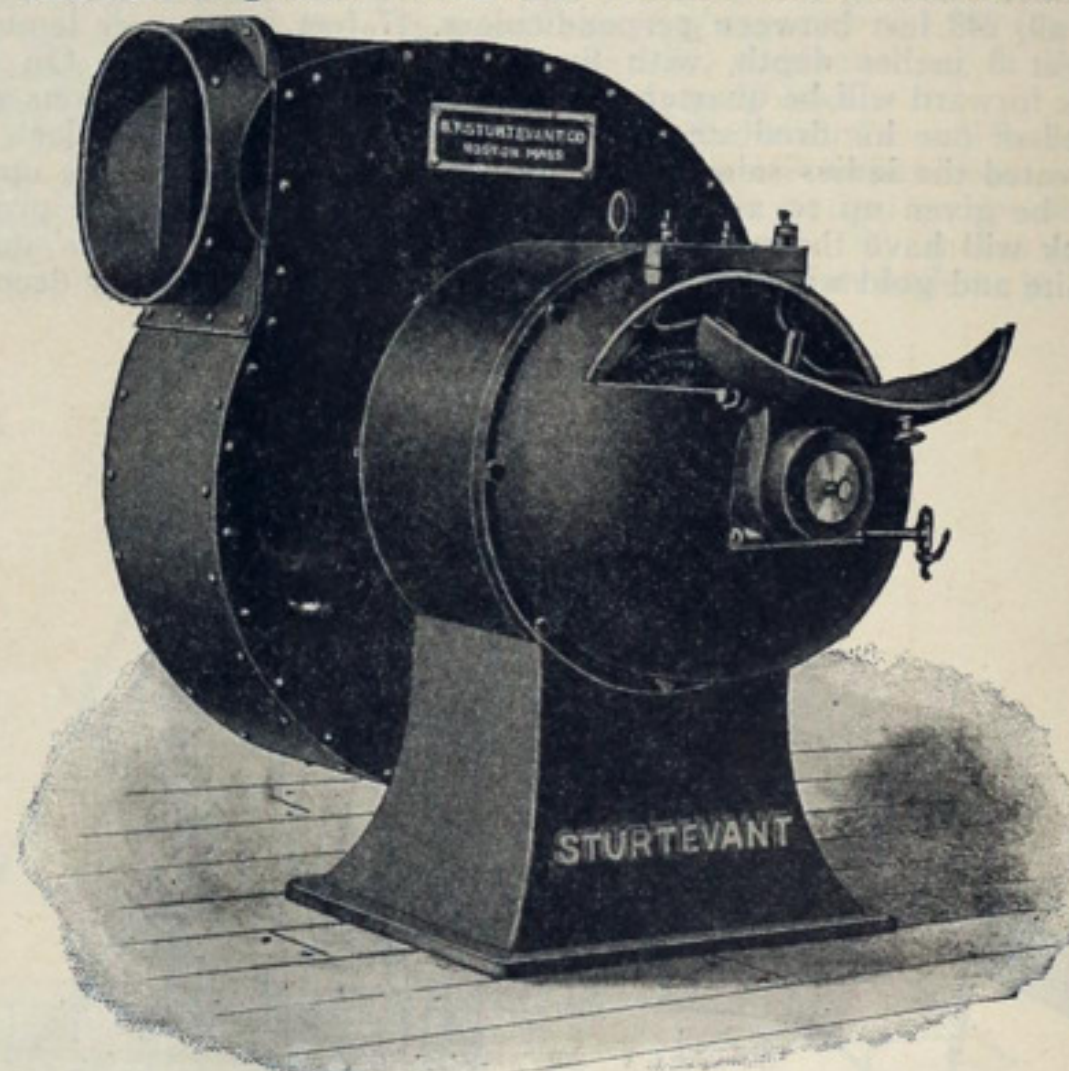
Major Clinton B. Sears, United States engineer in charge of harbor

works on Lake Superior, will open bids July 1 for building pile and timber revetments for the ship-canal across Keweenaw point, Michigan. Capt. Edw. Burr, United States engineer corps, custom house, St. Louis, advertises for proposals for the construction and delivery of sixty flat boats. Bids will be opened June 22.

A big transfer freight house and three or more grain elevators will be added to South Chicago's shipping interests during the summer by three railroads—the Pittsburg, Fort Wayne & Chicago, the Baltimore & Ohio and the Michigan Central, which have entered into an agreement for their completion. The freight house will be located in the vicinity of 106th street and the elevators at points on the west bank of the Calumet river. Work has already begun at 106th street on the freight house. The roads will also build a new railroad bridge at 121st street.

ADJUSTABLE ELECTRIC STEEL PLATE EXHAUSTER.

In the adjustable type of fan shown herewith, the fan is supported upon the end of the cast iron motor case, and is so arranged for adjustment that it may be swung round this case as a center, and thus arranged to discharge in any given direction. The enclosed type of motor is exactly similar to the general open types built by the B. F. Sturtevant Co. of Boston, Mass., through whose courtesy we present this illustration. The field ring is of wrought iron in the smaller size and of cast



steel in the larger sizes. To its sides are bolted the hemispherical ends as shown. These ends serve to enclose the motor, while the door on the outer side renders the interior readily accessible. The motor is of the multi-polar type, the field pieces being of wrought iron. The armature is of the barrel wound type, and the commutator is of ample size with large radiating surface. The brushes are of fiber graphite, and the holders of the reaction type. Ring oiler boxes in the centers of the cylindrical ends serve to support the armature shaft, upon the inner end of which the fan is also mounted. The fan here represented is of the steel plate type, and is open upon one side only, namely, the farthest from the motor. It thus acts as an exhauster, and connection may be made from the inlet to any desirable source.

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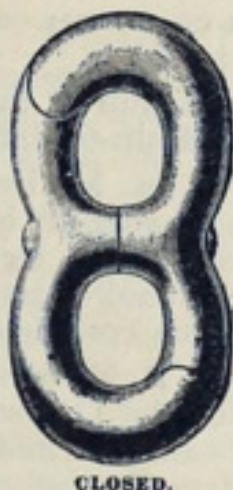
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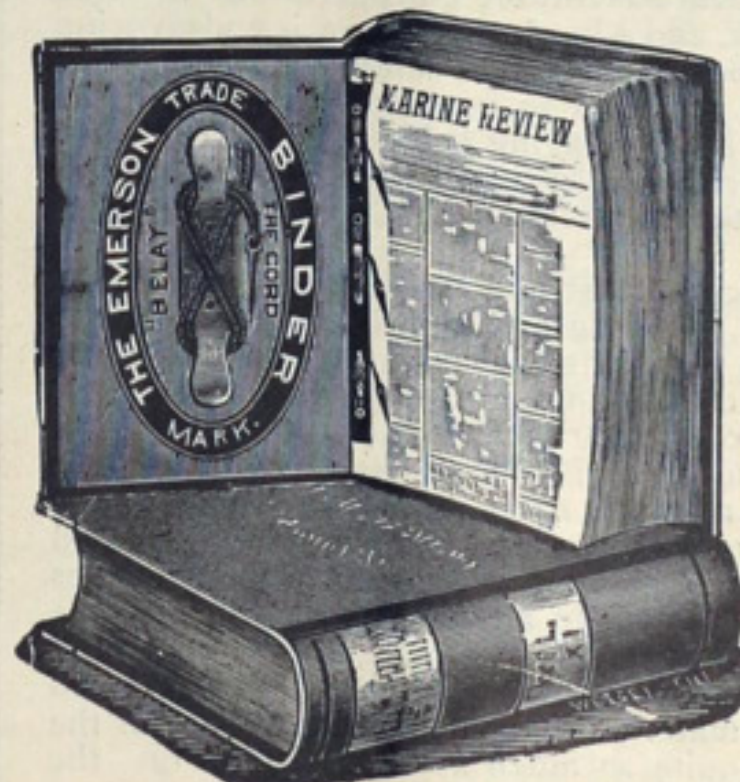
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Train No. 5, night express for Akron, Canton and Chicago, leaves Cleveland daily at 10:00 P. M. and arrives at Chicago 9 o'clock following A. M. Carries through Pullman vestibule sleeping car, Cleveland to Chicago, and elegant dining car, Garrett to Chicago.

Train No. 47 for Akron, Canton and Chicago, leaves Cleveland daily at 6:35 P. M. Carries through coach, Cleveland to Chicago, with Pullman vestibule sleeping cars, Akron to Chicago, arriving at 7 o'clock following A. M.

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City ticket office, No. 241 Superior Street.

Depot foot of South Water and Champlain Streets.

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C. L. KIMBALL, A. G. P. Agt., Cleveland, O.

The Navy League of Great Britain is organizing a great demonstration in honor of Capt. A. T. Mahan, the naval representative of the United States at the Hague peace conference, as a recognition of his services rendered to naval men. A banquet will be given to Capt. Mahan and the committee expects to have the highest and most representative British society to meet him.

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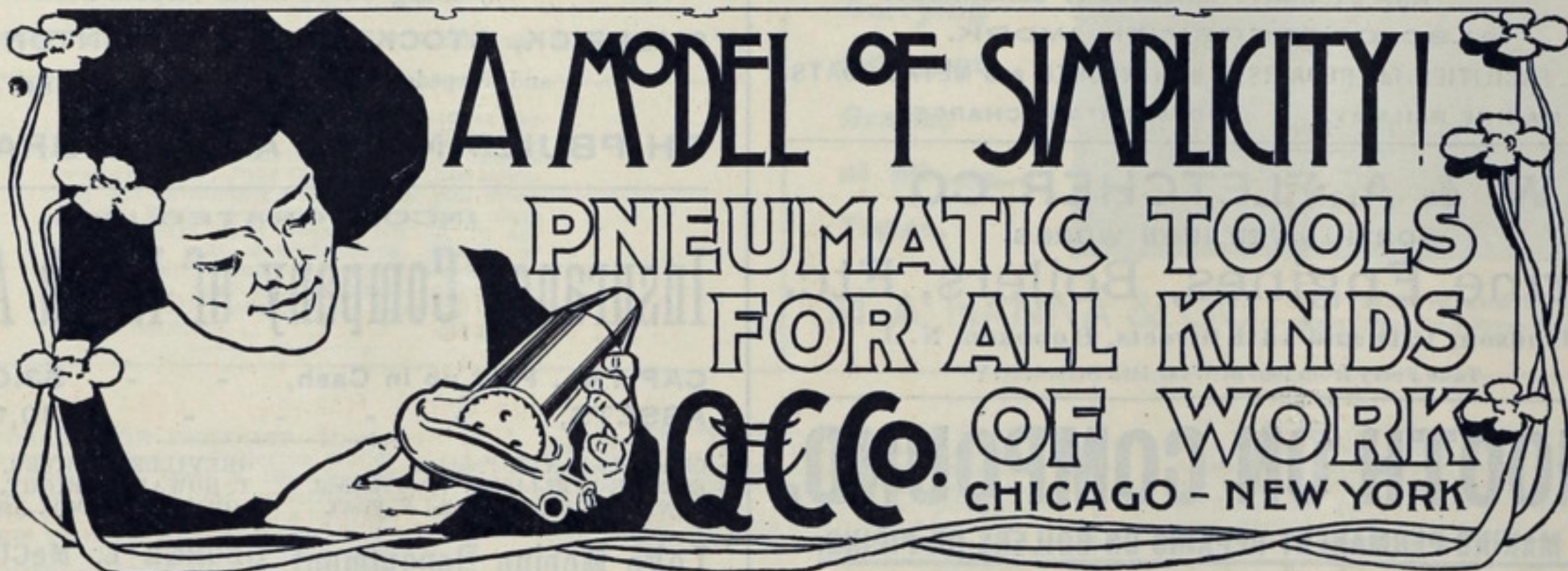
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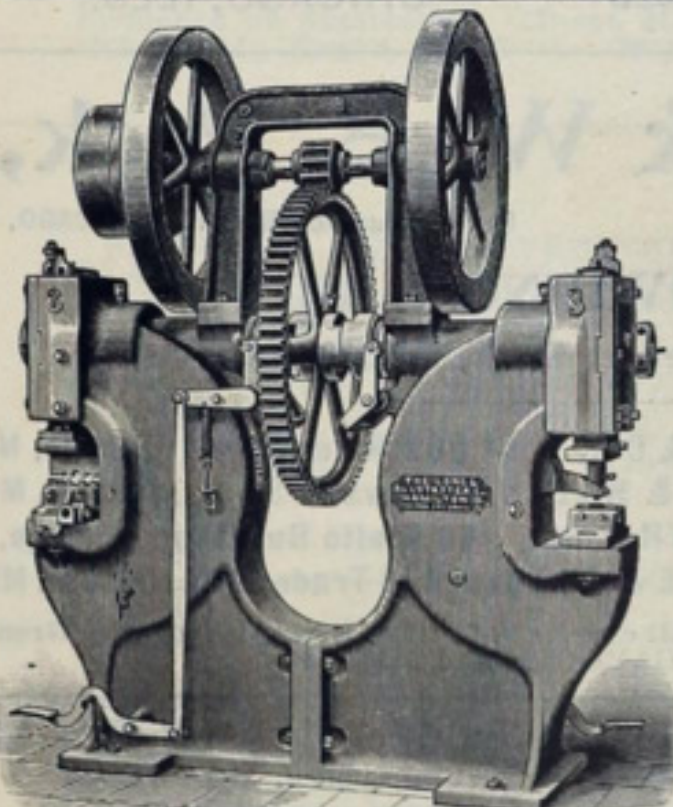
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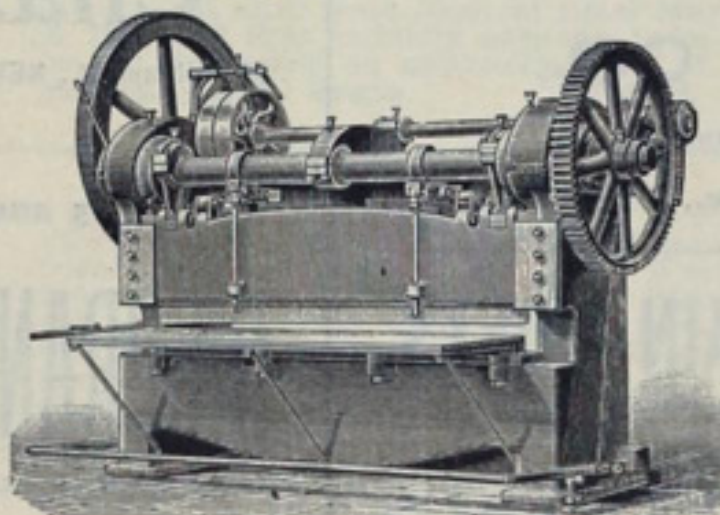
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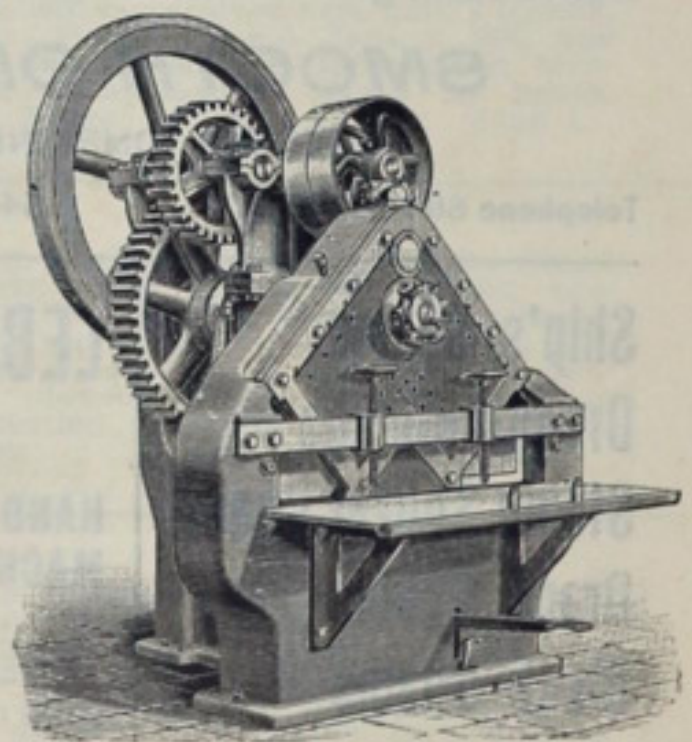
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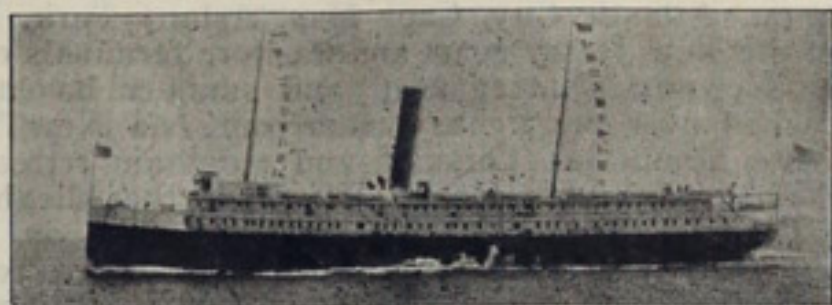


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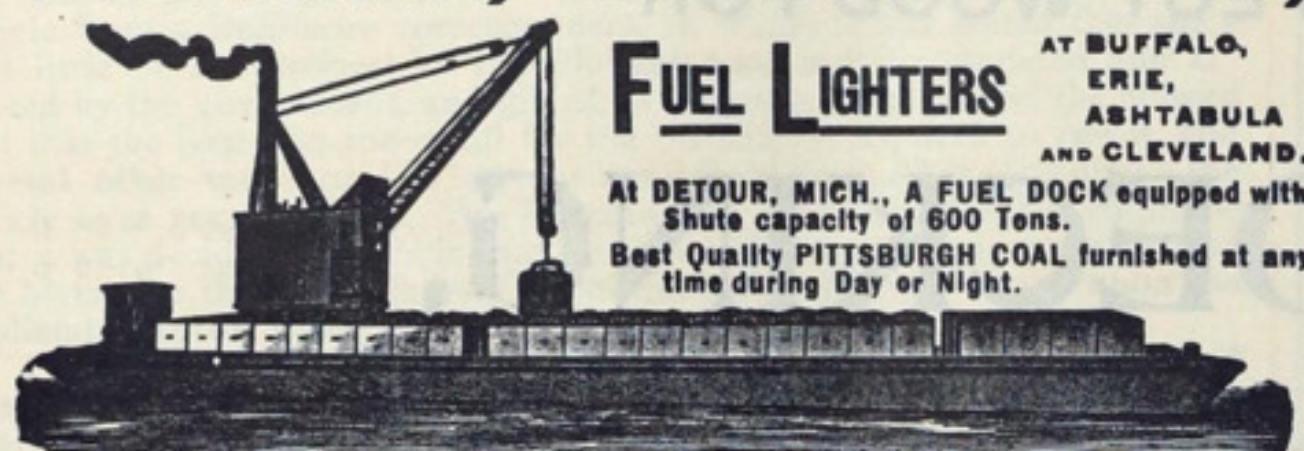
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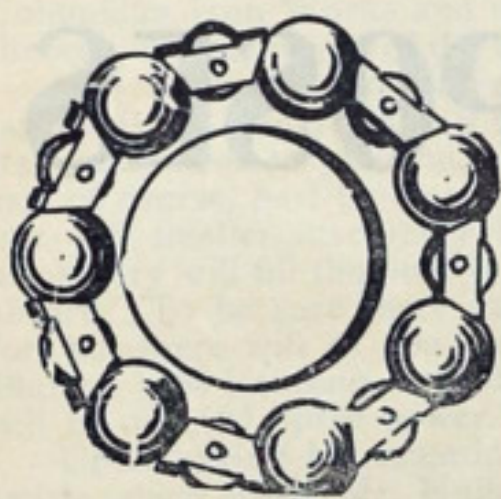
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Sealed proposals will be received at the office of the Light House Board, Treasury Department, Washington, D. C., until 2 o'clock, p. m., June 10, 1899, and then opened, for furnishing the material and labor of all kinds necessary for a first class steel steam light vessel, No. 72, in accordance with specifications, copies of which, with blank proposals and other information may be had upon application to F. J. Higginson, Rear Admiral, U. S. N., Chairman. May 25.

PROPOSALS FOR DREDGES.—Mississippi River Commission, Fullerton Building, St. Louis, Mo., April 19, 1899.—Sealed proposals, in triplicate, for construction and delivery of two self-propelling hydraulic dredges complete with machinery, cabin, outfit, etc., will be received here until 12 o'clock noon, standard time, May 31, 1899, and then publicly opened. Information furnished on application. Mason M. Patrick, Capt., Engrs, Sec'y. May 25.

PROPOSALS FOR CONSTRUCTION OF FLAT BOATS.—U. S. ENGINEER OFFICE, Custom House, St. Louis, Mo., May 23 1899. Sealed proposals for construction and delivery of sixty flat boats will be received here until 12 o'clock, noon, June 22, 1899, and then publicly opened. Information furnished on application. Edw. Burr, Captain, Engrs. June 15.

U. S. Engineer Office, Duluth, Minn., June 1, 1899. Sealed proposals for building pile and timber revetments for Ship Canals across Keweenaw Point, Mich., will be received here until noon, July 1, 1899, and then publicly opened. Information furnished on application here, or, at branch office, Houghton, Mich. Clinton B. Sears, Major, Engrs. June 22.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., May 10, 1899. Sealed proposals for repairing Government Piers at Holland (Black Lake), Mich., will be received here until 3 p. m., June 9, 1899, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs. June 1.

U. S. Engineer Office, 1637 Indiana Ave., Chicago, Ill., April 25, 1899. Sealed proposals for dredging in Calumet River will be received until noon (central time) May 25, 1899, and then publicly opened. Information furnished on application. W. L. Marshall, Maj., Engrs. May 18.

U. S. Engineer Office, 185 Euclid Ave., Cleveland, O., May 12, 1899. Sealed proposals for constructing part of West Breakwater at Conneaut Harbor, Ohio, will be received here until 2 o'clock, p. m., central standard time, June 12, 1899, and then publicly opened. Information furnished on application. Jared A. Smith, Col., Engineers. June 8.

U. S. Engineer Office, 185 Euclid Ave., Cleveland, O., May 12, 1899. Sealed proposals for constructing part of West Breakwater at Fairport Harbor, Ohio, will be received here until 2 o'clock p. m., central standard time, June 12, 1899, and then publicly opened. Information furnished on application. Jared A. Smith, Col., Engrs. June 8.

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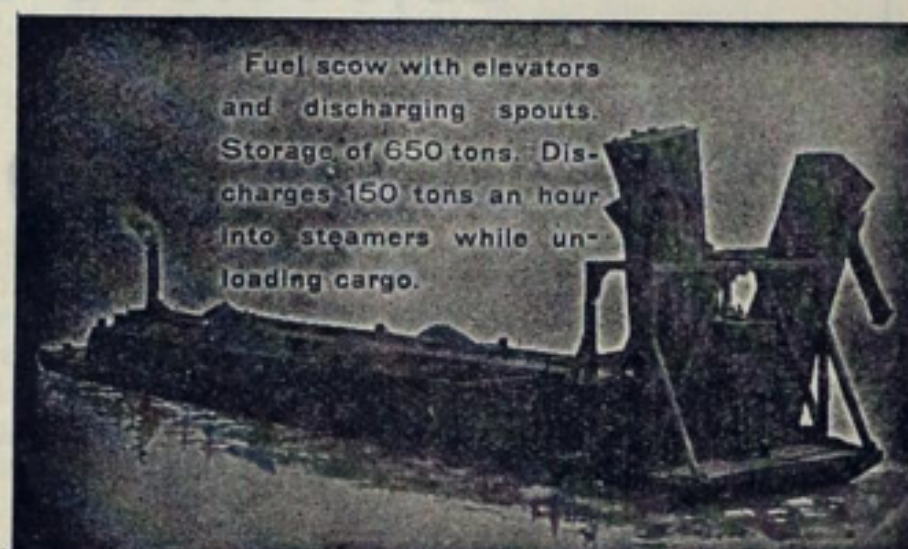
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U. S. Engineer Office, Galveston, Tex., May 15, 1899. Sealed bids, in triplicate, for deepening channel from Galveston Harbor to Texas City, Tex., will be received until 2 p. m., June 15, 1899, and then publicly opened. For information apply to C. S. Riche, Capt., Engrs. June 8.

U. S. Engineer Office, 185 Euclid Ave., Cleveland, O., May 9, 1899. Sealed proposals for dredging in Cleveland Harbor, Ohio, will be received here until 2 o'clock, p. m., standard time, June 9, 1899, and then publicly opened. Information furnished on application. Jared A. Smith, Col., Engrs. June 1.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., May 11, 1899. Sealed proposals for repairing government piers at Grand Haven, Mich., will be received here until 3 p. m., June 10, 1899, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs. June 8.

U. S. Engineer Office, 57 Park St., Grand Rapids, Mich., May 15, 1899. Sealed proposals for repairing government piers at Muskegon, Mich., will be received here until 3 p. m., June 14, 1899, and then publicly opened. Information furnished on application. Chester Harding, Capt., Engrs. June 8.

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